+
TL830
U581

8506 +
G 49

# U.S. WORKS PROGRESS ADMINISTRATION

# BIBLIOGRAPHY
# OF
# AERONAUTICS

## Part 25 - Air Navigation

## Part 26 - Flight Instruments

Compiled from the
INDEX OF AERONAUTICS
of the
INSTITUTE OF THE AERONAUTICAL SCIENCES

30 Rockefeller Plaza
New York City

The Index and Bibliographies have been prepared
by workers under the supervision of the
U.S. WORKS PROGRESS ADMINISTRATION
John R. Palmer
Managing Project Supervisor
Project 665-97-3-76

FEBRUARY

1939

CORNELL
UNIVERSITY
LIBRARY

# FOREWORD

This bibliography is one of a series pertaining to aeronautics and is published by the U. S. Works Progress Administration with funds allotted to Project 665-97-3-76 for that purpose.

The project, sponsored by the New York City Department of Docks, receives the cooperation of the Institute of the Aeronautical Sciences which also directs the research and publishing staff workers.

## Request for Additional References

The Institute of the Aeronautical Sciences invites corrections and criticism of the bibliographies and requests that additional references be forwarded to the Institute for inclusion in the final publications.

## Distribution Requests

The bibliographies may not be sold. However, persons and organizations desiring copies may apply for them by letter, stating the use for which they are required. These requests will be considered in the order received. Should the supply be exhausted, such requests will receive first consideration when additional copies are published.

Robert R. Dexter
Aeronautical Engineer

Address all correspondence to:

John R. Palmer
Managing Project Supervisor
U.S. Works Progress Administration
5111 R.C.A. Building
New York City

# ABBREVIATIONS

A.R.C. R. & M. - Great Britain. Aeronautical research committee. Reports and Memoranda.

A.S.M.E. - American society of mechanical engineers, New York.

Atti Assoc. ital. aerotecn. - Atti dell'Associazione italiana di aerotecnica. Roma.

C.A.H.I. - Central aero-hydrodynamical institute, Moscow.

C.I.N.A. - Commission internationale de navigation aérienne, Genève.

C. R. Acad. sci. - Comptes rendus hebdomadaires des séances de l'Académie des sciences, Paris.

D.V.L. - Deutsche versuchsanstalt für luftfahrt, Berlin.

F.A.I. - Fédération aéronautique internationale, Paris.

H.M. Stat. off. - His Majesty's Stationery office, London.

N.A.A. - National aeronautic association, Washington.

N.A.C.A. - National advisory committee for aeronautics, Washington.

N.P.L. - National physical laboratory, Teddington, England.

Pub. scient. tech. Min. de l'air. - Publications scientifiques et techniques du Ministère de l'air. Service des recherches de l'aéronautique, Paris.

R.A.F. - Royal air force (Great Britain)

R.A.S. - Royal aeronautical society (Great Britain)

Rend. Instituto sper. aer. - Rendiconto dell'Istituto, sperimentale aeronautico, Roma.

S.A.E. - Society of automotive engineers, New York.

U.S. Govt. print. off. - U.S. Government printing office, Washington.

V.D.I. - Verein deutscher ingenieure, Berlin.

W.G.L. - Wissenschaftliche gesellschaft für luftfahrt, Berlin.

Z.A.M.M. - Zeitschrift für angewandte mathematik und mechanik, Berlin.

Z.F.M. - Zeitschrift für flugtechnik und motorluftschiffahrt, München.

# TABLE OF CONTENTS

## Section I

BOOKS AND PAMPHLETS ON AIR NAVIGATION..........1

## Section II

PERIODICAL ARTICLES, BOOKS AND PAMPHLETS, ON AIR NAVIGATION, CLASSIFIED BY SUBJECT.

Celestial....................................11
Celestial - Sextants.....................20
Dead Reckoning.............................22
Dead Reckoning - Calculators...............30
Maps and Charts............................33
Pilotage...................................38
Radio Position Finding.....................43
General....................................58

## Section III

BOOKS AND PAMPHLETS ON FLIGHT INSTRUMENTS.....61

## Section IV

PERIODICAL ARTICLES, BOOKS AND PAMPHLETS, ON FLIGHT INSTRUMENTS, CLASSIFIED BY SUBJECT.

Airspeed Indicator.........................71
Altimeter - Sonic..........................77
Altimeter - General........................81
Artificial Horizon.........................87
Automatic Pilot............................89
Bank and Turn Indicator....................99
Barograph..................................102
Climb Indicator............................105
Compass
  Aperiodic................................107
  Deviation, Compensation..................108
  Earth Inductor...........................112
  Gyro.....................................114
  Magnetic.................................116
  Sun......................................120
  Telemagnetic.............................121
  General..................................123
Drift and Speed Indicator..................126
Inclinometer...............................128
Panel......................................130
Radio Direction Finder.....................133
General....................................145

AUTHOR INDEX...............................149

## Section I

## BOOKS AND PAMPHLETS ON AIR NAVIGATION

Martin's air navigation, by C. W. Martin. London, The Eversley press, ltd., 1938. 303 p. charts, diagrs., illus., tables.

Practical air navigation and the use of the aeronautical charts of the U.S. Coast and geodetic survey, by Thoburn C. Lyon. Washington, U.S. Govt. print. off., 1938. 185 p. diagrs., maps, plates.

The Air almanac. Great Britain. Air ministry. London, H. M. Stat. off., 1937. tables. (Air publication no. 1602)

Air navigation, British Empire edition, by Philip V. H. Weems. London; New York, McGraw-Hill publishing company, inc., 1937. 490 p. bibliog., charts, diagrs., illus., maps.

Astronomical navigation made easy, by George William Ferguson. London; New York, Sir Isaac Pitman and sons, ltd., 1937. 78 p. illus.

The Complete air navigator, by D. C. T. Bennett. London, Sir Isaac Pitman and sons, ltd., 1937. 272 p. diagrs., tables.

Grundlagen der flugzeugnavigation, von Werner Immler. München und Berlin, R. Oldenbourg, 1937. 180 p. bibliog., charts, diagrs., illus., tables.

Aerial navigation, by J. E. Dumbleton. London, Technical press, 1936. 180 p. illus.

Die Luftfahrt navigation, von Theodore E. Sönnichsen. Berlin, E. S. Mittler und sohn, 1936. 166 p. illus.

Air navigation, by Frank Wilbur Wead and James Ross Allen. (In their Practical flying and meteorology. Scranton, Pa., International text book company, 1935. p. 1-82. diagrs., illus., maps)

Flugfunkpeilwesen und funknavigation, von Rudolf Grötsch. Berlin-Tempelhof, Deutsch-literarisches institut, J. Schneider, 1935.

How to find your way in the air, by George William Ferguson. London, Sir Isaac Pitman and sons, 1935. 72 p. diagrs., illus.

AIR NAVIGATION

Manual of air navigation. Great Britain. Air ministry. London, H. M. Stat. off., 1935. 295 p. diagrs., illus., maps, tables. (Air publication no. 1234)

La Navigation aérienne simplifiée, par F. d'Autheville. Paris, Berger-Levrault, 1935. 98 p. diagrs., illus.

Navigation tables for mariners and aviators, by Joseph Young Dreisonstok. Washington, U.S. Govt. print. off., 1935. 111 p. illus., tables. (Hydrographic office publication no. 208)

Practical air navigation and the use of the aeronautical charts of the Department of commerce, by Thoburn C. Lyon. Washington, U.S. Govt. print. off., 1935. 63 p. diagrs., illus., maps. (U.S. Coast and geodetic survey special publication no. 197)

Practical air navigation simply explained, by John Kenneth Summers. London, Sir Isaac Pitman and sons, ltd., 1935. 57 p. diagrs.

Aerial navigation. Prepared by Pan American airways, inc.; arranged by International correspondence schools. Scranton, Pa., International textbook company, 1934. 64 p. diagrs., illus., maps.

How the airman finds his way, by Frank Vivian Monk and H. T. Winter. London; Glasgow, Blackie and son, 1934. 64 p. charts, illus.

I.C.S. altitude and azimuth tables for air and sea navigation. International correspondence schools. Scranton, Pa., International text book company, 1934. 91 p.

Instructions for the aircraft navigational computer, mark VII, Bureau of aeronautics, U. S. Navy. Copyrighted by Philip Dalton. Washington, 1934. 23 p. diagrs.

Instructions for the aircraft navigational plotting boards, mark I and mark II, Bureau of aeronautics, U.S. Navy. Copyrighted by Philip Dalton. Washington, 1934. 15 p.

Modern up-to-date navigation, by H. S. Blackburne. Glasgow, Brown, son and Ferguson, 1934.

Navigation and nautical astronomy, by Benjamin Dulton. Annapolis, Md., United States naval institute, 1934. 473 p. illus.

Manual of air navigation, by command of the Air council air ministry, Jan. 1933. Great Britain. Air ministry. London, H. M. Stat. off., 1933. 359 p. charts, diagrs., tables. (Air publication no. 1456)

Simplified aerial navigation by dead reckoning, by John Alexander McMullen. Philadelphia, Pa., J. B. Lippincott and company, 1933. 104 p. diagrs., illus.

Dead reckoning altitude and azimuth table, by Arthur Ainsley Ageton. Washington, U.S. Govt. print. off., 1932. 49 p. diagrs., table. (Hydrographic office publication no. 211)

Navegación aérea, por José Maria Aymat. Barcelona, Editorial labor, s.a., 1932. 449 p. diagrs., illus., maps.

Aerial and marine navigational tables, by John E. Gingrich. New York, McGraw-Hill book company, 1931. 63 p. diagr., tables.

Air navigation for the private owner, by Frank Arthur Swoffer. London, Sir Isaac Pitman and sons, ltd., 1931. 131 p. diagrs., illus., maps, plates, tables.

Air navigation maps. July 1, 1931. Department of commerce. Aeronautics branch. Washington, U.S. Govt. print. off., 1931. 13 p. maps. (Aeronautics bulletin no. 10)

Avigation, by Bradley Jones. New York, John Wiley and sons, 1931. 314 p. diagrs., illus.

Avigation, by Harvey Hodges Holland. New York; London, McGraw-Hill book company, inc., 1931. 272 p. diagrs., illus.

Beiträge zur flugfunkeigenpeilung, von Heinrich Gloeckner. (In Jahrbuch 1931 der D.V.L. München und Berlin, p. 672-78. diagrs., illus., map)

Cross-country flying, by Oliver Stewart. New York, R. R. Smith, inc., 1931. 116 p. diagrs., illus.

Fundamentals of aerial navigation, by A. Inozemtzev. Kharkov, Russia, 1931. 69 p. diagrs., illus.

How to get the most out of your direction finder and the Kaess radio compass and direction finder. Lindenhurst, New York, Marine department, Airplane and marine direction finder corporation, 1931. 31 p. diagrs.

The Navigation of the air and meteorology, by Leslie S. Potter. New York; London, Harper and brothers, 1931. 233 p. diagrs., maps.

Navigazione aerea ad uso dei piloti e degli ufficiali di rotta di 2$^{a}$ classe, di Guglielmo Tinaglia. Bergamo, Anonima Bolio, 1931. 77 p. diagrs., illus., map.

Navigazione aerea; corso allievi piloti - anno 1931, di Fortunato Barbieri. Roma, Stabilimento tipo-litografico di A. Sampaolesi, 1931. 128 p. diagrs., illus.

Position tables for aerial and surface navigation. Washington, U.S. Govt. print. off., 1931. 223 p. diagrs., tables. (Hydrographic office publication no. 209)

Synopsis on aero-navigation, by Y. Rozenberg. Moscow, Military school for pilots, 1931. 69 p.

Radio aids to navigation 1930, including details of radiocompass stations, radiobeacons, weather bulletins, storm and navigational warnings, time signals, etc. Washington, U.S. Hydrographic office, 1930. 487 p. illus.

Text-book for air navigation, by B. V. Sterlugov. Moscow, Government military publication, 1930. 329 p. tables.

Aerial navigation and meteorology; a comprehensive treatise in simple language for the student with an average education, by Lewis Alonzo Yancey. New York, The Norman W. Henley publishing company, 1929. 316 p. diagrs., illus.

Aerial navigation. Office of the Chief of Air corps. U.S. War department, Washington, 1929. 71 p. diagrs.

Air navigation and meteorology, by Richard Duncan. Chicago, The Goodheart-Willcox company, inc., 1929. 246 p. diagrs., illus., maps.

Avigation by dead reckoning (aerial navigation), by Ienar Ewald Elm. Philadelphia, David McKay company, 1929. 120 p. diagrs., illus., map.

List of air navigation charts. October 15, 1929. U.S. Department of commerce. Aeronautics branch. Washington, U.S. Govt. print. off., 1929. 7 p. maps. (Aeronautics bulletin no. 10)

The Navigation of aircraft, by Logan Carlisle Ramsey. New York, The Ronald press company, 1929. 237 p. diagrs., illus., maps.

Orientation during flight, by N. K. Shtrihbakh. Moscow, 1929. 84 p. diagrs.

Aero-navigation, by A. G. Rovuchin. Moscow, School of naval pilots, 1928. 163 p. diagrs.

Arbeiten zur luftnavigierung. München, R. Oldenbourg, 1928. 63 p. illus.

## BOOKS AND PAMPHLETS

Herbert air navigation course, by Percy Herbert. Portland, Oregon, 1928. diagrs., illus.

Leitfaden der flugzeugnavigation, von Werner Immler. München und Berlin, R. Oldenbourg, 1928. 89 p. charts, diagrs., maps, tables.

Star altitude curves for obtaining a fix, given only the Greenwich siderial time and the observed altitudes of two stars. The use of the dead reckoning position, declination, right ascension, hour angle and azimuth is eliminated. Latitude 30° to 41° north, by Philip V. H. Weems. San Diego, Cal., Rodney Stokes company, 1928. 44 p.

Traité pratique de navigation aérienne, par A. B. Duval et L. Hébrard. Paris, Gauthier-Villars et cie., 1928. 196 p. diagrs., illus., maps.

Trattato elementare di navigazione aerea, di Luigi Biondi e G. Santoro. Milano, U. Hoepli, 1928. 319 p. diagrs., illus.

Arbeiten zur luftnavigierung, von D. H. Boykow, E. Everling und H. Koppe. München und Berlin, R. Oldenbourg, 1927.

Kartenkunde und flugzeugortung. Vol. I. Messgerätekunde. Vol. 2. Leitfaden für den unterricht an fliegerschulen. Oldenburg, Gerhard Stalling, 1927.

Navigational wireless, by Sidney Herbert Long. London, Chapman and Hall, ltd., 1927. 164 p. diagrs., illus., plates, tables.

Wireless direction finding and directional reception, by Ronald Keen. London, Iliffe and sons, ltd., 1927. 490 p. bibliog.

Funkpeilungen, von August Leib und Martin Nitzsche. Berlin, E.S. Mittler und sohn, 1926. 207 p. diagrs., illus., tables.

Cosmographie et navigation, par C. Cornet. Paris, Gauthier-Villars, 1925. 986 p. illus.

The Drift of an aircraft guided towards its destination by directional receiving of radio signals transmitted from the ground, by Edward Pearson Warner. Washington, 1925. 5 p. diagrs. plates. (N.A.C.A. Technical notes no. 220)

The "Navigraph," by Ives Le Prieur. Washington, 1925. 10 p. illus. (N.A.C.A. Technical memorandums no. 320) (From L'Illustration, Paris, Apr. 4, 1925)

Tafeln zur funkortung, von A. Wedemeyer. München und Berlin, R. Oldenbourg, 1925. 146 p. diagrs.

Text-book in aero navigation covering the fundamental information in aerology, by V. I. Vitkevich. Moscow, Vestnik vozdushnovo flota, 1925. 173 p. diagrs., illus., tables.

Astronomical methods in aerial navigation, by Hilding K. Beij. Washington, U.S. Govt. print. off., 1924. 52 p. illus. (N.A.C.A. Report no. 198)

A Directive type of radio beacon and its application to navigation, by F. H. Engel and Francis Winkley Dunmore. Washington, 1924. 15 p. illus. (U.S. Bureau of standards scientific papers no. 480)

Faites comme moi et vos calculs seront faits sans erreur et sans logarithmes aussi vite que vos observations, par Ch. Bertin. Paris, Librairie navale, Gauthier-Villars, 1924. 69 p. diagrs., illus., tables.

Methods and instruments in contemporary avio-navigation service, by P. A. Molchanov. Leningrad, 1924. 198 p. diagrs., illus., tables.

Ortsbestimmungen. A.-Terrestrische ortsbestimmung. B.-Astronomische ortsbestimmung. C.-Funkentelegraphische ortsbestimmung, von A. Wedemeyer und O. Nairz. (In Moedebecks taschenbuch für flugtechniker und luftschiffer. Berlin, 1923. p. 308-63. diagrs., illus.)

Aerial navigation and navigating instruments, by Herbert Nelson Eaton. Washington, U.S. Govt. print. off., 1922. 44 p. diagrs., illus. (N.A.C.A. Report no. 131)

Direction and position finding by wireless. Paris, Wireless press, ltd., 1922. 376 p. illus.

The Radio direction finder and its application to navigation, by F. A. Kolster and Francis Winkley Dunmore. Washington, 1922. (U.S. Bureau of standards scientific papers no. 428)

La Direction des avions par T.S.F., par Maurice Percheron. Paris, E. Leroux, 1921. 59 p. illus., plates.

Directive wireless telegraphy. Direction and position finding. The theory and practice of directive wireless transmission and reception as applied to the signalling and determination of direction and position on land, at sea, and in the air, by Louis H. Walter. New York, Sir Isaac Pitman and sons, 1921. 124 p. diagrs., illus. maps, tables.

## BOOKS AND PAMPHLETS

Le Droit radiogoniométrique, par Ch. Bertin. Paris, Gauthier-Villars et cie., 1921. 12 p. diagrs.

American practical navigator. An epitome of navigation and nautical astronomy, by Nathaniel Bowditch. Washington, U.S. Govt. print. off., 1920. 949 p. diagrs., illus., tables. (Hydrographic office publication no. 9)

Davis's sun's true bearing or azimuth tables 30°N-30°S, by P. L. H. Davis and John E. Davis. London, J. D. Potter, 1920.

A Primer of air navigation, by Harry Egerton Wimperis. London, Constable and company, ltd., New York, D. Van Nostrand company, 1920. 128 p. diagrs., illus., maps, tables.

Principles and practice of aerial navigation, by J. E. Dumbleton. London, C. Lockwood and son, 1920. 172 p. diagrs., illus., maps.

Theoretical courses on aeronautics for airship pilots. Compiled by Menez and E. J. F. Joux. Washington, U.S. Govt. print. off., 1920. 71 p. diagrs., illus. (War department document no. 909)

Air navigation - notes and examples, by S. F. Card. London, Edward Arnold, 1919. 140 p. diagrs., map, tables.

Navigation, by Arthur William Judge. (*In his* Handbook of modern aeronautics. London, The Library press, ltd., 1919. p. 767-77. diagrs., tables)

Navigation and nautical astronomy, by John H. C. Coffin. New York, D. Van Nostrand company, 1919. 259 p. diagrs., tables.

The Sumner line or line of position as an aid to navigation, by George Cary Comstock. New York, John Wiley and sons, 1919. 70 p. diagrs., maps.

Altitude, azimuth and line of position tables. Washington, U.S. Govt. print. off., 1918. (Hydrographic office publication no. 200)

La Bussola magnetica nell'aviazione. Appunti di nautica aerea, di Ernesto La Polla. Torino, S. Lattes e compagnia, 1918. 94 p. illus.

Davis "Ex-meridian" tables with supplementary azimuths, by P. L. H. Davis. London, J. D. Potter, 1918.

Der Flugmeister; was der flugzeugführer-und beobachter von der navigation wissen muss! Handbuch für flugzeugführer und beobachter zum nautischen unterricht und selbstunterricht, von Adolf Bortels. Berlin, D. Reimer (E. Vohsen) 1918. 144 p. charts, diagrs., illus.,

Flugzeugkompasswesen und flugsteuerkunde, von Werner Immler. Berlin-Charlottenburg, C. J. E. Volckmann nachf. g.m.b.h., 1918. 141 p. diagrs., illus., tables.

Der Kompassflieger, von K. Harmsen. Berlin, Klasing und co., 1918. 59 p. diagrs., illus., tables.

Map reading for aviators, with a chapter on aerial navigation, by Charles Beverley Benson. New York, Edwin N. Appleton, 1918. 55 p. diagrs., illus.

Navigation, magnetism and deviation of the compass, by H. T. A. Bosanquet and G. R. C. Campbell. Washington, U.S. Govt. print. off., 1918. 98 p.

Navigation und kompasskunde, von Friedrich W. T. Gagelmann und Franz Lieck. (In Klasings flugtechnische sammlung, v. 3. Berlin, Klasing und co., 1918. 59 p. diagrs., illus., map)

Navigation und seemannschaft im seeflugzeug; ein handbuch für marineflieger, von Theo. E. Sönnichsen. Berlin, R. C. Schmidt und co., 1918. 169 p. diagrs., illus., maps.

Practical tables for navigators and aviators, containing new and rapid methods for finding the longitude, azimuth and latitude and for great circle sailing, the identification of stars and for plotting line of position by the Sumner and Marcq Saint-Hilaire methods, by Armistead Rust. Philadelphia, The author, 1918. 116 p. diagrs., tables.

Simplified navigation for ships and aircraft; a text book based upon the Saint Hilaire method, by Charles Lane Poor. New York, The Century company, 1918. 123 p. diagrs., maps, tables.

Air navigation for flight officers, by Albert Edward Dixie. Portsmouth, Gieves publishing company, ltd.; London, J. Hogg, 1917. 223 p. diagrs., illus.

Utilisation de la carte et de la boussole en aviation, par Maurice Percheron. Paris, Librairie aéronautique, 1917. 27 p. illus.

Dip and refraction for aerial navigation. U.S. Naval observatory under the authority of the Secretary of the navy. Washington, U.S. Govt. print. off., 1916. 3 p.

## BOOKS AND PAMPHLETS

Steering by the stars for night flying, by J. D. White. London, J. D. Potter, 1916. 32 p. illus.

Der Flugzeugkompass und seine handhabung; kompasskompensierenkursabsetzen. Ein handbuch für flugzeugführer und beobachter, von Fritz Gansberg. Berlin, M. Krayn, 1915. 43 p. diagr.

Marching or flying by night without a compass, by W. A. Tilney. London, Hugh Rees, 1915. 15 p. maps, tables.

Davis's star azimuth tables 30°N to 30°S, by P. L. H. Davis. London, J. D. Potter, 1914.

Grundriss der geographischen ortsbestimmung, von K. Graff. Berlin, G. J. Göschen, 1914. 210 p. illus., tables.

Tafeln zur astronomischen ortsbestimmung, von Arnold Kohlschütter. Berlin, J. Springer, 1913. 3 p. chart, tables.

Astronomische ortsbestimmungen mit besonderer berücksichtigung der luftschiffahrt, von Walter Leick. Leipzig, Quelle und Meyer, 1912. 130 p. illus.

Orientierung auf überlandflügen auf grund praktischer erfahrungen, von Hans Steffen und Otto Bertram. Berlin, R. Eisenschmidt, 1912. 54 p. diagrs., illus., maps, plates.

Ein Beitrag zur astronomischen ortsbestimmung im luftfahrzeuge. Vortrag, gehalten am 14. januar 1911 im Kaiserlichen aero-club, Berlin, von Oskar Voigt. Berlin, Druck: J. Lehmann, 1911. 15 p. illus.

Navigation von luftfahrzeugen. Literaturzusammenstellung über aeronautische ortsbestimmung, von R. Süring. (In Moedebecks taschenbuch für flugtechniker und luftschiffer. Berlin, 1911. p. 569-72)

## Section II

## PERIODICAL ARTICLES, BOOKS, PAMPHLETS, ETC., ON AIR NAVIGATION, CLASSIFIED BY SUBJECT.

### CELESTIAL

Hughes' flight navigators and navigation procedure. Aero digest, New York, Aug. 1938, v. 33, no. 2, p. 63-64. illus.

Orientation and landfall by precomputed curves, by William C. Bentley. Aero digest, New York, Aug. 1938, v. 33, no. 2, p. 92-95. diagrs.

Astronomical navigation, by E. H. D. Spence. Flight, London, June 9-16, 1938, v. 33, p. 568B-D, 596-97. diagr.

Air navigation and modern aircraft, by F. J. Fressanges. R.A.F. quarterly, London, Apr. 1938, v. 9, p. 132-35.

Le Point astronomique, par A. Bastien. L'Aérophile, Paris, May, Oct. 1937, Mar. 1938, v. 45-46, p. 111-12; 235-36; 68-69. diagrs., illus.

La Formazione rapida ed economica del navigatore completo, di Valentino Pivetti. Rivista aeronautica, Roma, Jan.-Feb. 1938, v. 14, no. 1-2, p. 36-52; 256-69.

Finding your way in the air, by Philip V. H. Weems. Aviation, New York, Dec. 1937, Jan. 1938, v. 36-37, p. 28-29, 73, 77; 28-29. illus.

Eine Allgemeine höhentafel von aeronautischer genauigkeit, von C. Wirtz. Deutsche seewarte, Hamburg, 1938, v. 7, no. 6, p. 171-73. table.

Simplifying astronomical navigation. Flight, London, Sep. 30, 1937, v. 32, no. 1501, p. 336.

Fixing positions in air navigation; device developed from a commercial star globe, by J. M. Gardner. Aero digest, New York, June 1937, v. 30, no. 6, p. 44. diagrs., illus.

Nouvelle alidade pour la navigation, par L. Reymond. Revue de l'armée de l'air, Paris, June 1937, v. 9, p. 714-18. diagrs.

La Navigation astronomique, par J. Delsuc. L'Air, Paris, Mar. 20, 1937. 2 p. diagrs., illus.

Die Dynamische auffassung navigatorischer probleme, von Werner Immler. Hansa, Hamburg, Feb. 27-Mar. 6, 1937, v. 74, no. 9-10, p. 448-50; 482-84.

Verfahren und geräte der luftnavigation, von Oswald Schmidt. Feinmechanik und präzision, Leipzig, Feb. 1937, v. 45, no. 2, p. 17-20. illus.

Astronomical navigation, by D. C. T. Bennett. (In his The Complete air navigator. London, Sir Isaac Pitman and sons, ltd., 1937. p. 184-249. diagrs., tables)

Celestial navigation by Philip V. H Weems. (In his Air navigation. London; New York, McGraw-Hill publishing company, ltd., 1937. p. 246-70. diagrs., illus.)

Kurzes rechenverfahren zur astronomischen ortsbestimmung im luftverkehr, von H. Coldewey. Der Seewart, Hamburg, 1937, v. 6, no. 10, p. 391-93. table.

Le Calculateur-marqueur de point astronomique Bastide-Lepetit type 300. Revue de l'armée de l'air, Paris, Dec. 1936, p. 1425-29. illus.

A Fix from altitude and azimuth at sea and in the air, by Radler de Aquino. U.S. Naval institute proceedings, Menasha, Wis., Dec. 1936, v. 62, p. 1727-34. illus.

Additional uses for H. O. 211, by Hulbert Hinkel, Jr. U.S. Naval institute proceedings, Menasha, Wis., June 1936, v. 62, no. 450, p. 848-56. diagrs.

Problèmes de navigation astronomique particuliers à la navigation aérienne, par L. Daviot. Bulletin de l'Association technique, maritime et aéronautique, Paris, 1936, no. 40, p. 471-508.

Calculateur de point astronomique Bastide-Lepetit no 300. La Technique aéronautique, Paris, 4e trimestre, 1935, v. 26, no. 138, p. 297-98. diagr.

Sulla determinazione continua delle coordinate azimutali di un astro in un lungo volo, di Giuseppe Severino. Rivista aeronautica, Roma, Dec. 1935, v. 11, no. 12, p. 435-42.

Air navigation wrinkle, by Thomas L. Thurlow. U. S. Naval institute proceedings, Menasha, Wis., Aug. 1935, v. 61, p. 1125-27. table.

Langstrecken - navigation in luftfahrzeugen über land und see im in-und ausland, von Wilhelm Niemann, Hansa, Hamburg, June 29-July 13, 1935, v. 72, no. 26-28, p. 1043-47; 1081-85; 1124-28. diagrs., illus., map, tables.

## CELESTIAL

La Navigation astronomique et l'aviation, par Guyot. Revue de l'armée de l'air, Paris, June 1935, v. 7, no. 71, p. 619-27.

Nuovi calcolatori di navigazione astronomica per aeromobili, di Giuseppe Simeon. Rivista aeronautica, Roma, Mar. 1935, v. 11, no. 3, p. 447-60. diagrs., illus.

Principle of astronomical navigation, by G. W. Ferguson. Airways and airports, London, Mar. 1935, v. 11, no. 12, p. 466-68. diagrs., illus.

Practical air navigation. (In Manual of air navigation. London, H. M. Stat. off., 1935. ch. 9, p. 77-111. diagr., tables. (Air publication no. 1234)

De quelques procédés récents de points astronomiques en vol, par A. Bastide. L'Aéronautique, Paris, Oct. 1934, v. 16, no. 142, p. 89-97. diagrs., illus.

Nuevo método de determinación de la altura de un astro, por Joaquin Aviles. Revista general de marina, Madrid, Oct. 1934, v. 115, p. 475-79.

Un Nouvel appareil de calcul rapide du point astronomique à bord d'avion, par Guyot. L'Aéronautique, Paris, Sep. 1934, v. 16, no. 184, p. 73-81. diagrs., illus.

De quelques contributions étrangères a la navigation aérienne astronomique, par A. Bastide. Revue de l'armée de l'air, Paris, June-July 1934, v. 6, no. 59-60, p. 653-72; 787-805. diagr. (Also La Revue des forces aériennes, Paris, July 1933, v. 48, p. 761-74)

Trans-ocean flying, by Frank Vivian Monk and H. T. Winter. (In their How the airman finds his way. London; Glasgow, Blackie and son, 1934. p. 38-48. diagr.)

Navigation by slide-rule, by Philip V. H. Weems. Popular aviation, Chicago, Sep. 1933, v. 13, no. 3, p. 167, 209. diagrs.

Check by sextant, by Royal Leonard. Western flying, Los Angeles, May 1933, v. 13, no. 5, p. 10-12.

Influencia recíproca del arte de navegar en la mar y en el aire, por Pedro Cardona. Revista general de marina, Madrid, May 1933, v. 112, p. 742-57.

Le Point astronomique dans la navigation aérienne, par Daillière. Revue des forces aériennes, Paris, Apr.-May 1933, v. 5, p. 391-411, 511-34. diagrs., illus.

## AIR NAVIGATION

Air navigation, by Norman MacMillan. Journal of the R.A.S., London, Apr. 1933, v. 37, no. 268, p. 307-45. illus.

Risoluzione grafica di un problema astronautico, di N. Galante. Rivista aeronautica, Roma, Apr. 1933, v. 8, p. 7-13. diagrs.

Present status of air navigation, by Philip V. H. Weems. U.S. Naval institute proceedings, Menasha, Wis., Mar. 1933, v. 59, no. 361, p. 399-404. diagrs.

Determinazione del punto nelle regioni polari, di G. Neumayer. Rivista aeronautica, Roma, Feb. 1933, v. 8, p. 263-78. diagrs., tables.

Nuevo sistema de navegar por los aires, por Santiago Cárdenas. Chile aéreo, Santiago de Chile, Jan. 1933, v. 3, no. 45, p. 29-33. illus.

Un Metodo americano per determinare di notte il punto mediante osservazioni di stelle, di Giuseppe Ceccotti. Rivista aeronautica, Roma, Dec. 1932, v. 8, no. 12, p. 524-28. diagr.

Sulle determinazioni di posizione nei lunghi voli, di Giuseppe Severino. Rivista aeronautica, Roma, Dec. 1932, v. 8, no. 12, p. 534-52. illus., tables.

Aerial navigation in practice, by Alexander Magyar. National aeronautic magazine, Washington, June 1932, v. 10, no. 6, p. 16-18. diagrs., illus.

Aerial navigation - methods and equipment, by Harold Gatty. Aircraft engineering, London, May 1932, v. 4, no. 39, p. 128. illus. (*Also* S.A.E. journal, New York, Apr. 1932, v. 30, no. 4, p. 153-58, 170)

Discarding sideral time in the solution of star sights, by John E. Gingrich. U.S. Naval institute proceedings, Menasha, Wis., Feb. 1932, v. 58, no. 348, p. 266-68. (*Abstract* Revista general de marina, Madrid, July 1932, v. 111, p. 117-20)

Questions and answers on aerial navigation, by John W. Geppert. Southern aviation, Atlanta, Ga., Sep.-Dec. 1931, v. 3, no. 1-4, p. 9-10, 18; 11-12; 5-7, 11; 5-7. illus.

Sulle determinazioni di posizione con una sola osservazione d'altezza, di Giuseppe Severino. Rivista aeronautica, Roma, Sep. 1931, v. 7, no. 9, p. 496-509. diagrs.

## CELESTIAL

Determination of position in high latitudes, with particular reference to aircraft observation, by C. J. Stewart. Nature, London, Aug. 8, 1931, v. 128, no. 3223, p. 212-14. diagrs.

Notes on aerial navigation, by P. F. Everitt. U. S. Naval institute proceedings, Menasha, Wis., Aug. 1931, v. 57, no. 342, p. 1065-68.

Reglas generales de la navegación aérea, por Carlos Montecino. Chile aéreo, Santiago de Chile, June 1931, v. 2, no. 26, p. 19-25.

Avigation. Time - its relation to navigation, by Philip V. H. Weems. Aeronautical world, Los Angeles, Mar.-Apr. 1931, v. 4, no. 3-4, p. 12-13, 16; 48. diagrs.

Tables for use in aero navigation by astronomical methods, by P. F. Everitt. Journal of the R.A.S., London, Feb. 1931, v. 35, no. 242, p. 167-72.

Astro-navigation, by Symarokova. Vestnik vozdushnovo flota, Moscow, 1931, no. 7, p. 57-58. diagrs.

General astronomy. Standard astronomic methods, by Bradley Jones. (In his Avigation. New York, John Wiley and sons, 1931. p. 116-84. diagrs., tables)

Great circle computations, by Bradley Jones. (In his Avigation. New York, John Wiley and sons, 1931. p. 68-77. tables)

The Methods employed in astronomical avigation, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 232-57. diagrs., illus., tables)

Plane and spherical flying, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 189-219. charts, diagrs., map)

Position tables for aerial and surface navigation. Washington, U.S. Govt. print. off., 1931. 223 p. diagrs., illus., tables. (Hydrographic office publication no. 209)

Considerazioni sull'impiego della navigazione astronomica in volo, di Attilio Biseo. Rivista aeronautica, Roma, Aug. 1930, v. 6, no. 8, p. 260-78. diagrs.

Avigation in commercial aviation, by Logan Carlisle Ramsey. Aero digest, New York, Feb. 1930, v. 16, no. 2, p. 73-74, 236.

Sulla determinazione del punto in volo con due altezze di stella, di Giuseppe Severino. Notiziario tecnico di aeronautica, Roma, Jan. 1930, v. 6, no. 1, p. 1-10. illus.

Astronomy in a given route flight, by I. Spirin. Vestnik vozdushnovo flota, Moscow, 1930, no. 12, p. 11-12.

Aerial navigation, by Douglas G. Jeffrey. Aeronautics, Chicago, Oct.-Nov. 1929, v. 5, no. 4-5, p. 29-30, 48, 50, 58, 80. illus.

How and why of navigation. Theory of celestial navigation, by George R. Fairlamb, Jr. Airway age, East Stroudsburg, Pa., Oct. 1929, v. 10, no. 10, p. 1616-19.

Air navigation, by George R. Fairlamb, Jr. Aeronautical engineering, New York, July-Sep. 1929, v. 1, no. 3, p. 151-57.

Meridiana solare per l'orientamento in volo, di Giuseppe Simeon. Rivista aeronautica, Roma, June 1929, v. 5, no. 6, p. 535-47. illus.

Grundsätzliches zur flugzeugnavigation, von Werner Immler. Z.F.M., München, May 14, 1929, v. 20, no. 9, p. 217-24. diagrs., tables.

Aerial navigation for the novice. Sumner line of position method, by Douglas G. Jeffrey. Popular aviation, Chicago, May 1929, v. 4, no. 5, p. 59-62, 86. illus.

Aerial navigation, by Philip V. H. Weems. U. S. Naval institute proceedings, Menasha, Wis., Apr. 1929, v. 55, no. 314, p. 315-20. illus., plates.

Die Avigation und ihre mittel, von Alfried Gymnich. Luftfahrt, Berlin, Feb. 22-Mar. 7, 1929, v. 33, no. 4-5, p. 56-58; 68-71. illus.

Su un nuovo metodo per determinare il punto in volo con osservazioni astronomiche. Notiziario tecnico di aeronautica, Roma, Feb. 1929, v. 7, no. 2, p. 1-9. diagr.

Aerial astronomy, by Logan C. Ramsey. (In his The Navigation of aircraft. New York, The Ronald press company, 1929. p. 109-76. diagr., illus.)

Informe sobre una orientación astronómica en el aire, mediante medios gráficos, sin cálculos, por Adolfo Marcuse. Icaro, Madrid, Dec. 1928, no. 12, p. 361-62.

## CELESTIAL

Celo-navigation of aircraft, by George R. Fairlamb, Jr. Airway age, East Stroudsburg, Pa., Nov. 1928, v. 9, no. 11, p. 53-56. diagrs.

Position finding by means of star altitude curves, by Philip V. H. Weems. Aero digest, New York, Nov. 1928, v. 13, no. 5, p. 918, 1026. diagrs.

Aerial navigation examples, by Philip V. H. Weems. Aero digest, New York, Oct. 1928, v. 13, no. 4, p. 670, 852-53. diagrs.

Avigation, by Philip V. H. Weems. Popular aviation, Chicago, May, Sep. 1928, v. 2-3, p. 38-40, 42; 35-36.

Navigation at sea and in the air, by Philip V. H. Weems. American society of naval engineers journal, Washington, Aug. 1928, v. 40, no. 3, p. 516-20. (*Also* Pacific marine review, San Francisco, Cal., June 1928, v. 25, no. 6, p. 255-57) (*Abstract* Airway age, East Stroudsburg, Pa., Oct. 1928, v. 9, no. 10, p. 54-55)

Celestial avigation. Bulletin of the Daniel Guggenheim fund for the promotion of aeronautics, New York, July 13, 1928, no. 9. 3 p.

Better navigation, by H. V. Wiley. Aviation, New York, Jan. 9, 1928, v. 24, no. 2, p. 96-97.

Astronomical observations taken from high altitudes, by F. E. Uttmark. Aero digest, New York, Jan. 1928, v. 12, no. 1, p. 44. illus., tables.

Some practical questions of night orientation, by I. Spirin. Vestnik vozdushnovo flota, Moscow, 1928, no. 4, p. 16-19. diagrs.

Star altitude curves for obtaining a fix, given only the Greenwich siderial time and the observed altitudes of two stars. The use of the dead reckoning position, declination, right ascension, hour angle and azimuth is eliminated. Latitude 30° to 41° north, by Philip V. H. Weems. San Diego, Cal., Rodney Stokes company, 1928. 44 p.

Oversea navigation, by A. F. Hegenberger and B. Jones. S.A.E. journal, New York, Dec. 1927, v. 21, no. 6, p. 699-702. illus.

Navigation des avions du service commercial pour l'Amérique du Sud, par Gago Coutinho et Jorge de Castilho. (*In* IV Congresso internazionale di navigazione aerea, Oct. 24-30, 1927, Roma, v. 2, p. 100-25)

Modern methods in sea and air navigation, by Radler de Aquino. U.S. Naval institute proceedings, Menasha, Wis., Jan. 1927, v. 53, p. 17-34. diagrs., tables.

Die Platzorientierung im luftfahrzeuge bei nacht (signalwesen) unter ausschluss der funkentelegraphie, von D. H. Boykow. (In Arbeiten zur luftnavigierung. München und Berlin, R. Oldenbourg, 1927. p. 1-8. illus.)

Ortsbestimmungen in der luft und auf see, von P. Perlewitz. Der Luftweg, Berlin und München, Mar. 25, 1926, no. 6, p. 62-64.

Methods of sea and air navigation, by J. P. Ault. Scientific monthly, New York, Jan. 1926, v. 22, p. 60-63.

Navigation of aircraft by astronomical methods, by J. P. Ault. Carnegie institution publication, Washington, 1926, v. 5, no. 175, p. 315-37. diagrs., illus., tables.

Practical navigation of aircraft, by F. Tymms. Journal of the R.A.S., London, May 1925, v. 29, no. 173, p. 202-39. illus. (Also Flight, London, Mar. 26, 1925, v. 17, no. 13, p. 192)

Uber die genauigkeit der luftnavigierung, von J. Van der Hoop. Luftfahrt, Berlin, July 5, 1924, v. 28, no. 7, p. 116-20. diagrs.

Astronomical methods in aerial navigation, by Hilding K. Beij. Washington, U.S. Govt. print. off., 1924. 52 p. illus. (N.A.C.A. Report no. 198)

Air navigation. Part II - Celestial navigation methods, by Herbert Nelson Eaton. U.S. Air services, Washington, Oct. 1923, v. 8, no. 10, p. 39-44.

Aerial navigation, by A. P. Rowe. Journal of the R.A.S., London, Sep. 1923, v. 27, no. 153, p. 450-58. diagrs., illus.

Ortsbestimmung. A. Terrestrische ortsbestimmung. B. Astronomische ortsbestimmung. C. Funkentelegraphische ortsbestimmung, von A. Wedemeyer und O. Nairz. (In Moedebecks taschenbuch für flugtechniker und luftschiffer. Berlin, 1923, p. 308-63. diagrs., illus.)

Uber die grundlagen der nautik des luftmeeres, von Conrad Harmsen. Schiffbau, Berlin, Jan. 4, 11, 25, Feb. 1, 1922, v. 23, no. 14-15, 17-18, p. 403-08; 435-39; 495-501; 533-38. diagrs., tables)

Nuevo procedimiento de ubicación astronómica en el aire. Tohtli, Mexico, Mar.-Apr. 1921, v. 6, no. 3-4, p. 104.

# CELESTIAL

Navigatie in vliegtuigen, door J. S. C. Olivier. Marineblad, 1921, v. 36, p. 324-49. diagrs., tables.

Navigation aérienne et navigation maritime, par N. Thierry. L'Aéronautique, Paris, Apr. 1920, v. 1, no. 11, p. 466-71. illus., map.

Aerial navigation instructions - provisional. Washington, U.S. Govt. print. off., 1920. 44 p. diagrs., maps, tables. (Air service information circular no. 82)

American practical navigator. An epitome of navigation and nautical astronomy, by Nathaniel Bowditch. Washington, 1920. 949 p. illus., tables.

Sul problema dell'orientamento: un nuovo diagramma azimutale. L'Aeronauta, Roma, Jan. 1919, v. 2, no. 1, p. 10-11. diagrs.

Navigation and nautical astronomy, by John Huntington Crane Coffin. New York, D. Van Nostrand company, 1919. 259 p. diagrs., tables.

The Sumner line or line of position as an aid to navigation, by George Cary Comstock. New York, John Wiley and sons, 1919. 70 p. diagrs., maps.

Orientamento notturno ed astronomia. L'Aeronauta, Roma, Sep. 1918, v. 1, no. 8, p. 226-28.

The Chart as a means of finding geographical position by observations of celestial bodies in aerial and marine navigation, by G. W. Littlehales. U.S. Naval institute proceedings, Menasha, Wis., Mar. 1918, v. 44, p. 567-81. maps, tables.

Altitude, azimuth and line of position tables. Washington, U.S. Govt. print. off., 1918. (Hydrographic office publication no. 200)

Practical tables for navigators and aviators, containing new and rapid methods for finding the longitude, azimuth and latitude and for great circle sailing, the identification of stars and for plotting line of position by the Sumner and Marcq Saint-Hilaire methods, by Armistead Rust. Philadelphia, Pa., J. E. Hand and sons, 1918. 116 p. diagrs., illus., tables.

Steering by the stars for night flying, by J. Dundas White. London, J. D. Potter, 1916. 32 p. illus.

Nuovo metodo di orientazione per aeroplani e per navi. Rassegna aero-marittima, Roma, Jan. 15-31, 1915, v. 5, no. 1-2, p. 13.

Tabellen zur astronomischen ortsbestimmung, von Arnold Kohlschütter. Berlin, J. Springer, 1913. 3 p. chart, tables.

Astronomische ortsbestimmungen mit besonderer berücksichtigung der luftschiffahrt, von Walter Leick. Leipzig, Quelle und Meyer, 1912. 130 p. illus.

Astronomische aeronavigation. Osterreichische flugzeitschrift, Wien, Aug. 10, 25, 1911, v. 5, no. 15-16.

Ein Beitrag zur astronomischen ortsbestimmung mit dem Voigtschen instrument, von W. Hormel. Deutsche zeitschrift für luftschiffahrt, Berlin, Mar. 7, 1911, v. 15, no. 5, p. 14-18. illus.

Ein Beitrag zur astronomischen ortsbestimmung im luftfahrzeuge, von Oskar Voigt. Berlin, Druck: J. Lehmann, 1911. 15 p. illus.

## CELESTIAL - SEXTANTS

Low cost sextant. Aero digest, New York, Sep. 1937, v. 31, no. 3, p. 90.

Aeronautical and navigational instruments, by G. W. H. Gardner. Journal of scientific instruments, London, Feb. 1937, v. 14, no. 2, p. 52-56. illus.

The Chronometer and sextants, by D. C. T. Bennett. (In his The Complete air navigator. London, Sir Isaac Pitman and sons, ltd., 1937. p. 169-82. diagrs., tables)

The Sextant, by Philip V. H. Weems. (In his Air navigation. London; New York, McGraw-Hill publishing company, 1937. p. 287-304. illus.)

Fairchild sextant for aircraft use. Aero digest, New York, Aug. 1936, v. 29, no. 2, p. 62. illus.

Bausch and Lomb aircraft sextant. Aero digest, New York, June 1936, v. 28, no. 6, p. 60. illus.

Accuracy of bubble sextant observations, by Philip V. H. Weems. Aero digest, New York, Jan. 1936, v. 28, no. 1, p. 65-66. diagrs.

Aerial navigation - sextant, by A. J. Hughes. Shell aviation news, London, Jan. 1936, no. 55, p. 16-18. illus.

Bubble sextant, by Mrs. M. T. Weems. Popular aviation, Chicago, May 1934, v. 14, no. 5, p. 297-98. diagrs., illus.

Genauigkeit von höhenbeobachtungen mit dem periskopsextanten, von Gustav Förstner. Zeitschrift für metallkunde, Berlin, Dec. 28, 1933, v. 24, no. 24, p. 680-84. diagrs., illus., tables.

New aircraft sextant for use with visible horizon, by L. Becker. Journal of the R.A.S., London, Aug. 1933, v. 37, no. 272, p. 703-07.

Ein Neuer pendelkreis der Askania-werke A.-G., Berlin-Friedenau, von Fuss. Zeitschrift für instrumentenkunde, Berlin, Apr. 1933, v. 53, no. 4, p. 152-59. diagrs., illus.

Un Nuovo tipo di sestante per aeronautica, di M. Tenani. L'Aerotecnica, Roma, June-July 1931, v. 11, no. 6-7, p. 760-66. diagrs., illus.

A Brief historical survey of airplane instruments (bubble sextant), by William G. Brombacher and K. Hilding Beij. Popular aviation, Chicago, Dec. 1928, v. 3, no. 6, p. 40, 42, 46, 50, 52, 56, 110, 112-113. illus.

El Sextante Gago Coutinho. Icaro, Madrid, June-Aug. 1928, no. 6-8, p. 194-98. illus.

Davis-Radford (K & E) octant installed on naval aircraft. Aviation, New York, July 9, 1928, v. 25, no. 2, p. 131.

Wilson bubble octant installed on naval aircraft. Aviation, New York, July 9, 1928, v. 25, no. 2, p. 130. illus.

Synopsis of french aeronautic equipment. Washington, 1928. 18 p. illus. (N.A.C.A. Technical memorandums no. 476) (From L'Aéronautique, Paris, Sep. 1927, no. 100)

Aircraft instruments for overseas navigation, by Victor E. Carbonara. S.A.E. journal, New York, Nov. 1927, v. 21, p. 528-31. illus.

The Aircraft bubble sextant, Type A, by R. C. Parker. Journal of the American society of naval engineers, Washington, May 1926, v. 38, no. 2, p. 301-17. illus.

New types of aircraft instruments (bubble type sextant), by F. L. Hunt. Journal of the Optical society of America and Review of scientific instruments, Menasha, Wis., Mar. 1926, v. 12, no. 3, p. 227-69. illus.

Aircraft instruments, by Herbert N. Eaton, K. Hilding Beij and William G. Brombacher. New York, The Ronald press company, 1926. 269 p. diagrs., illus., plates.

Aerial navigation instruments, by G. P. Luckey. U.S. Air service, Washington, Jan. 1924, v. 9, no. 1, p. 35-38.

## AIR NAVIGATION

Air navigation instruments (excluding compasses). Great Britain. Air ministry. London, H. M. Stat. off., 1924. 28 p. diagrs., illus. (Air publication no. 803)

The Sextant and air navigation. Aviation, New York, Oct. 15, 1923, v. 15, no. 16, p. 492-93.

Navigational equipment for long distance flights, by H. E. Wimperis. (In International air congress report for 1923. London, 1923, p. 756-65. diagrs., illus., maps.)

Les Instruments de bord et de navigation pour aéronefs. Le sextant Baker. Le Génie civil, Paris, Apr. 15, 1922, v. 80, p. 345. diagrs.

Design of instruments for navigation of aircraft, by G. M. B. Dobson. Geographical journal, London, Nov. 1920, v. 56, no. 5, p. 370-89. diagrs., illus.

Pulfrich sextant, by F. J. B. Cordeiro. Scientific american, monthly, New York, Jan. 1920, v. 1, p. 44. diagr.

New navigating instruments made for transatlantic flight. S.A.E. journal, New York, July 1919, v. 5, no. 1, p. 77. (Also Automotive industries, Philadelphia, Pa., May 22, 1919, v. 40, p. 1135)

Baker air sextant, by T. Y. Baker. Transactions of the Optical society, London, June 1919, v. 20, no. 9, p. 340-42. diagrs.

Ein Libellenquadrant in neuer form für astronomische ortsbestimmungen, von Hartmann. Deutsche luftfahrer-zeitschrift, Berlin, Oct. 2, 1912, v. 16, no. 20, p. 495-96.

Ein Libellenquadrant in neuer form für astronomische ortsbestimmungen, von W. Lindt. Deutsche luftfahrer-zeitschrift, Berlin, May 29, 1912, v. 16, no. 11, p. 273-74.

Zur frage der ortsbestimmung nach fixsternen mit dem libellenquadranten, von L. von Kobbē. Deutsche luft-fahrer zeitschrift, Berlin, Mar. 6, 1912, v. 16, no. 5, p. 105-06. diagrs.

## DEAD RECKONING

Navigation and direction finding, by C. W. Martin. (In his Martin's air navigation. London, The Eversley press, ltd., 1938. p. 250-303)

Finding your way in the air. Part III - Dead reckoning, by Philip V. H. Weems. Aviation, New York, Sep. 1937, v. 36, p. 38-39, 76. diagrs., illus.

La Navigation par mauvais temps et ses moyens, par J. Delsuc. L'Air, Paris, June 20, 1937. 3 p. diagrs., illus.

Die Flugzeugkurssteuerung im geradeausflug, von Winfried Oppelt. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4-5, p. 270-82. diagrs., tables.

Die Dynamische auffassung navigatorischer probleme, von Werner Immler. Hansa, Hamburg, Feb. 27-Mar. 6, 1937, v. 74, no. 9-10, p. 448-50, 482-84.

Verfahren und geräte der luftnavigation, von Oswald Schmidt. Feinmechanik und präzision, Leipzig, Feb. 1937, v. 45, no. 2, p. 17-20. illus.

Dead reckoning navigation, by D. C. T. Bennett. (*In his* The Complete air navigator. London, Sir Isaac Pitman and sons, ltd., 1937. p. 148-68. diagrs., tables)

The Theory of dead reckoning, by Philip V. H. Weems. (*In his* Air navigation. London; New York, McGraw-Hill publishing company, ltd., 1937. p. 104-91. diagrs., illus., map)

Der Luvwinkel (abtrift) in der flugnavigation, von P. Perlewitz und J. Powel. Annalen der hydrographie und maritimen meteorologie, Berlin, Nov. 1936, v. 64, no. 11, p. 462-68. bibliog., diagr.

Abtrift und luvwinkel, von Werner Immler. Annalen der hydrographie und maritimen meteorologie, Berlin, May 15, 1936, v. 64, no. 5, p. 209-13. diagrs., tables.

Navigeringsdiagrammet, av B. Lundberg. Flygning, Stockholm, Feb. 1936, v. 14, p. 1b-3b, 8b. diagrs.

Drift determination in aerial navigation, by I. E. Hobbs. U.S. Naval institute proceedings, Menasha, Wis., Jan. 1936, v. 62, no. 395, p. 28-30.

Winds aloft and ground speed, by Harold H. Strickland. Aero digest, New York, Aug. 1935, v. 27, p. 20. charts, tables.

Determination of courses. Dead reckoning, by Frank Wilbur Wead and James Ross Allen. (*In their* Practical flying and meteorology. Scranton, Pa., International text book company, 1935. p. 58-82. diagrs., map)

Practical air navigation. Great Britain. Air ministry. (*In* Manual of air navigation. London, H. M. Stat. off., 1935. p. 77-111. diagr., tables) (Air publication no. 1234)

Accuracy in aerial dead reckoning, by Harold Gatty. U. S. Naval institute proceedings, Menasha, Wis., Nov. 1934, v. 60, no. 381, p. 1561-63. illus.

Trans-ocean flying, by Frank Vivian Monk and H. T. Winter. (*In their* How the airman finds his way. London; Glasgow, Blackie and son, 1934. p. 38-48. diagrs.)

Bestimmung der abtrift des windes, ohne astronomische - oder erdbodenbeobachtung und ohne zuhilfemahme von funkapparaten, von Raethjen. Luftwacht, Berlin, Oct. 1933, no. 10, p. 313-16.

L'Orientazione lontana nel volo in aeroplano, di Agostino Gemelli. L'Aerotecnica, Roma, Oct. 1933, v. 13, no. 10, p. 1294-1324. (*Abstract* Revista de aeronáutica, Madrid, Jan. 1934, v. 3, no. 22, p. 55)

Influencia recíproca del arte de navegar en la mar y en el aire, por Pedro Cardona. Revista general de marina, Madrid, May 1933, v. 112, p. 742-57.

Air navigation, by Norman MacMillan. Journal of the R.A.S., London, Apr. 1933, v. 37, no. 268, p. 307-45. illus.

Present status of air navigation, by Philip V. H. Weems. U.S. Naval institute proceedings, Menasha, Wis., Mar. 1933, v. 59, no. 361, p. 399-404. diagrs.

La Cinémodérivométrie, par Boutillier. Le Congrès international de la sécurité aèrienne, Paris, 1933, v. 4, p. 15-17.

Simplified aerial navigation by dead reckoning, by J. A. McMullen. Philadelphia, Pa., J. B. Lippincott company, 1933. 104 p. diagrs., illus.

Hints on aerial navigation in ocean flying, by J. H. Lindell. Aircraft, Melbourne, Nov. 1932, v. 2, no. 2, p. 9, 32. illus.

Drift due to engine torque, by H. Glauert. Aircraft engineering, London, July 1932, v. 4, no. 41, p. 176.

Aerial navigation - methods and equipment, by Harold Gatty. Aircraft engineering, London, May 1932, v. 4, no. 39, p. 128. illus. (*Also* S.A.E. journal, New York, Apr. 1932, v. 30, no. 4, p. 153-58, 170)

Sulla determinazione del punto di un aeromobile, di A. Tosi. Rivista marittima, Roma, May 1932, v. 65, no. 5, p. 143-55. illus.

Sulla determinazione del punto in volo con rette di altezza, di Giuseppe Simeon. Rivista aeronautica, Roma, Mar. 1932, v. 8, no. 3, p. 472-86. diagrs.

Drift caused by engine torque. Some experiments confirming the theoretical study on its importance and its effects on navigation, by L. J. Wackett. Aircraft engineering, London, Feb. 1932, v. 4, no. 36, p. 32-33, 44. illus., plan.

Ocean flying for beginners, by Francis Chichester. Air and airways, London, Jan.-Feb. 1932, v. 8, no. 10-11, p. 322-24, 365-67. diagr., illus.

Remarques au sujet de la méthode dite des "dérives résiduelles." Revue des forces aériennes, Paris, Feb. 1932, v. 4, p. 195-208. diagrs.

Ground speed and course correction, by A. W. Berry. Flight, London, Jan. 22, 1932, v. 24, no. 4, p. 70-71. tables.

Dead reckoning altitude and azimuth table, by Arthur Ainsley Ageton. Washington, U.S. Govt. print. off., 1932. 49 p. diagrs., tables. (Hydrographic office publication no. 211)

Rapid air navigation, by Joseph Young Dreisonstok. Aero digest, New York, Nov. 1931, v. 19, no. 5, p. 29-31, 86, 88, 90, 92-93. diagrs.

Zum navigationsproblem der luftfahrt, von R. von Mises. Z.A.M.M., Berlin, Oct. 1931, v. 11, no. 5, p. 373-81. diagrs.

Uber Zermelo's luftfahrtproblem, von Tulio Levi-Civita. Z.A.M.M., Berlin, Aug. 1931, v. 11, no. 4, p. 314-22. diagrs.

Verfahren zur raschen berechnung der deviationsbeiwerte aus in überschüssiger anzahl gemachten beobachtungen, von Otto Lacmann. Z.F.M., Berlin, June 29, 1931, v. 22, no. 12, p. 375-77. diagrs., tables.

Crossing the North Atlantic, by Harry P. Connor. Airway age, New York, June 6, 1931, v. 12, no. 10, p. 560-64. map.

Course plotting and course correction, by Peter H. Redpath. Aeronautical world, Los Angeles, Cal., Apr. 1931, v. 4, no. 4, p. 14-15. diagrs.

Course correcting - drift. Finding wind speed, by Leslie S. Potter. (In his The Navigation of the air and meteorology. New York; London, Harper and brothers, 1931. p. 101-45. diagrs.)

Cross country flying - night flying, by Leslie S. Potter. (In his The Navigation of the air and meteorology. New York; London, Harper and brothers, 1931. p. 126-34. diagrs., map)

The Dead reckoning, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 220-31. diagrs., tables)

Distance and track computations. Drift correction, by Bradley Jones. (In his Avigation, New York, John Wiley and sons, 1931. p. 53-67, 93-102. diagrs., tables)

The Effects of wind in avigation, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 96-119. charts, diagrs., illus.)

The Important relationship of time, distance and speed, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 32-48. illus., tables)

Position tables for aerial and surface navigation. Washington, U.S. Govt. print. off., 1931. 223 p. diagrs., illus., tables. (Hydrographic office publication no. 209)

A Summary of procedure in the combined practice of air pilotage and dead reckoning, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 172-86. diagrs., illus.)

Considerazioni su di un importante problema di navigazione aerea, di A. G. Mazzaron. Ala d'Italia, Milano, Oct. 1930, v. 9, no. 10, p. 822-24. illus.

Determinazione dei percorsi ortodromici a mezzo del calcolo, di Attilio Biseo. Rivista aeronautica, Roma, Apr. 1930, v. 6, no. 4, p. 49-56. illus.

Avigation in commercial aviation, by Logan C. Ramsey. Aero digest, New York, Feb. 1930, v. 16, no. 2, p. 73-74, 236. diagrs.

Avigation, by Frank W. Wead. Aeronautics, Chicago, Aug. 1929, v. 5, no. 2, p. 50, 52, 88.

## DEAD RECKONING

How and why of navigation. Dead reckoning explained, by George R. Fairlamb, Jr. Airway age, New York, Aug. 1929, v. 10, no. 8, p. 1202-07.

Méthode et appareils simples de navigation à l'estime, par M. Brion. L'Aéronautique, Paris, June 1929, v. 11, no. 121, p. 183-85. illus.

How and why of navigation. Cross country flying, by George R. Fairlamb, Jr. Airway age, New York, May 1929, v. 10, no. 5, p. 630-33.

Aerial navigation, by Philip V. H. Weems. U. S. Naval institute proceedings, Menasha, Wis., Apr. 1929, v. 55, no. 314, p. 315-20. illus., plates.

Die Avigation und ihre mittel, von Alfried Gymnich. Luftfahrt, Berlin, Feb. 22, Mar. 7, 1929, v. 33, no. 4-5, p. 56-58; 68-71. illus.

Aerial navigation for the novice. Practice of dead reckoning, by Douglas G. Jeffrey. Popular aviation, Chicago, Mar. 1929, v. 4, no. 3, p. 83-86, 88, 106-07. illus.

The Importance of dead reckoning in aerial navigation, by Logan C. Ramsey. U.S. Naval institute proceedings, Menasha, Wis., Jan. 1929, v. 55, no. 311, p. 27-30.

Avigation by dead reckoning (aerial navigation), by Ienar Ewald Elm. Philadelphia, David McKay company, 1929. 120 p. diagrs., illus., map.

Cross-country work, by Lewis Alonzo Yancey. (In his Aerial navigation and meteorology. New York, The Norman W. Henley publishing company, 1929. p. 136-62. diagrs., illus., tables)

Dead reckoning and plotting, by Logan C. Ramsey. (In his The Navigation of aircraft. New York, The Ronald press company, 1929. p. 57-94. diagrs., illus.)

Navigation ohne erdsicht bei nebel und über wolken, von Hermann Röder. Der Luftweg, Berlin-München, Aug. 1928, v. 15, no. 10, p. 163-64.

Note sur un problème de navigation, par J. Dagnaux. L'Aéronautique, Paris, Feb. 1928, no. 105, p. 58. illus.

Oversea navigation, by A. F. Hegenberger and Bradley Jones. S.A.E. journal, New York, Dec. 1927, v. 21, no. 6, p. 699-702. illus.

Navigation des avions du service commercial pour l'Amérique du Sud, par Gago Coutinho et Jorge de Castilho. (In IV Congresso internazionale di navigazione aerea, Roma, Oct. 24-30, 1927, Roma, 1927, v. 2, p. 100-25)

Modern methods in sea and air navigation, by Radler de Aquino. U.S. Naval institute proceedings, Menasha, Wis., Jan. 1927, v. 53, p. 17-34. diagrs., tables.

Ortsbestimmungen in der luft und auf see, von P. Perlewitz. Der Luftweg, Berlin und München, Mar. 25, 1926, no. 6, p. 62-64.

Methods of sea and air navigation, by J. P. Ault. Scientific monthly, New York, Jan. 1926, v. 22, p. 60-64.

De l'utilité d'une orientation nouvelle de la navigation aérienne, par William Loth. L'Air, Paris, Dec. 1, 1925, v. 7, no. 146, p. 19-21. (Abstract L'Ala d'Italia, Milano, Dec. 1925, v. 4, no. 12, p. 494)

Practical navigation of aircraft, by F. Tymms. Journal of the R.A.S., London, May 1925, v. 29, no. 173, p. 202-39. illus.

Mesure du vent en avion et correction de ses effets sur la route suivie, par A. Barbaud et R. LePetit. C.R. Acad. sci., Paris, Feb. 2, 1925, v. 180, p. 368-70. diagr.

How to use the data of the distribution and direction of wind as given by air navigation stations, by V. Vitkevich. Vestnik vozdushnovo flota, Moscow, 1925, no. 1, p. 36-37.

Uber die genauigkeit der luftnavigierung, von J. Van der Hoop. Luftfahrt, Berlin, July 5, 1924, v. 28, no. 7, p. 116-20. diagrs.

Le Point en aéronef, par L. Garin. Arts et métiers, Paris, May 1924, v. 77, no. 44, p. 161-70. diagrs., tables.

Les Effets du vent en aviation, par André Lainé. Le Génie civil, Paris, Feb. 2, 1924, v. 84, no. 5, p. 112-13. diagrs.

Aerial navigation, by A. P. Rowe. Journal of the R.A.S., London, Sep. 1923, v. 27, no. 153, p. 450-58. diagrs., illus.

Air navigation. Part I - Dead reckoning method, by Herbert N. Eaton. U.S. Air service, Washington, Sep. 1923, v. 8, no. 9, p. 37-40.

Une Nouvelle méthode simple de navigation aérienne à l'estime, par Louis Constantin. L'Aérophile, Paris, June 1-15, 1923, v. 31, no. 11-12, p. 177-78. diagrs.

Methods of air navigation. Formula and instruments for checking dead reckoning described, by Herbert V. Thaden. Aviation, New York, Feb. 27, 1922, v. 12, no. 9, p. 252-55. illus.

Uber die grundlagen der nautik des luftmeeres, von K. Harmsen. Schiffbau, Berlin, Jan. 4, 11, 25, Feb. 1, 1922, v. 23, no. 14-15, 17-18, p. 403-08; 435-39; 495-501; 533-38. diagrs., tables.

Une Solution du problème de l'orientation en avion. L'Industrie électrique, Paris, Jan. 25, 1922, v. 31, no. 710, p. 25-27. diagrs.

La Navigation à l'estime, par Pierre Moffert. (In Premier congrès international de la navigation aérienne, Paris, Nov. 1921, v. 2, p. 72-78. diagrs.)

A Possible new method of measuring drift. Aeronautical engineering supplement, London, Feb. 9, 1921, v. 20, no. 6, p. 131-32.

Navigatie in vliegtuigen, door J. S. C. Olivier. Marineblad, Helder, 1921, v. 36, p. 324-49. diagrs., tables.

Un Problème d'orientation, par L. Hirschauer. L'Aérophile, Paris, Apr. 1-15, 1920, v. 28, no. 7-8, p. 117. illus.

L'Emploi du dérivomètre dans le voyage aérien, par Maurice Brion. L'Aéronautique, Paris, Mar. 1920, v. 1, no. 10, p. 437-39. diagrs.

American practical navigator. An epitome of navigation and nautical astronomy, by Nathaniel Bowditch. Washington, U.S. Govt. print. off., 1920. 949 p. illus., tables. (Hydrographic office publication no. 9)

Position fixing in aircraft during long distance flights over the sea, by T. Y. Baker and L. N. G. Filon. London, Royal aeronautical society, 1920. 24 p.

Sur les erreurs d'estime que peut entrainer la connaissance incomplète du régime aérologique, par L. Dunoyer. C. R. Acad. sci., Paris, June 2, 1919, v. 168, no. 22, p. 1102-05.

Indicateur-jalonneur de route pour la navigation aérienne à l'estime, par L. Dunoyer. C. R. Acad. sci., Paris, Apr. 7, 1919, v. 168, no. 14, p. 726-29.

Practical tables for navigators and aviators, containing new and rapid methods for finding the longitude, azimuth and latitude and for great circle sailing, the identification of stars and for plotting line of position by the Sumner and Marcq Saint-Hilaire methods, by Armistead Rust. Philadelphia, J. E. Hand and sons co., 1918. 116 p. diagrs., tables.

## DEAD RECKONING - CALCULATORS

An All in one C.D.C. The latest Simmons-Goudime course and double drift calculator. Flight, London, Feb. 11, 1937, v. 31, no. 1468, p. 150. diagr.

Dead reckoning computers and tables, by Philip V. H. Weems. (In his Air navigation. London; New York, McGraw-Hill publishing company, 1937. p. 153-73. diagrs., illus., tables)

Course computer solves pilot's problems. Aircraft, Melbourne, Aug. 1, 1936, v. 14, no. 7, p. 17, 38. illus.

Dalton air navigation computer, type E. 1A, by Philip V. H. Weems. Aero digest, New York, June 1936, v. 28, no. 6, p. 52-53. diagrs., illus.

L'Aéro calculateur Gallus-Ducommun, par L. Martin. L'Air, Paris, Jan. 1936, no. 389. diagrs., illus.

Un Calculador de vuelos o estímetro, por Carlos Gonzalez. Revista de aeronáutica, Madrid, Sep. 1935, v. 4, no. 42, p. 442-45. diagrs., illus.

Mark VII - navigational computer for aircraft, by Philip V. H. Weems. Aero digest, New York, May 1935, v. 26, no. 5, p. 28.

Navigation computer - slide rule, by Philip V. H. Weems. Aero digest, New York, May 1935, v. 26, no. 5, p. 28. illus.

Un Nouvel appareil de calcul rapide de point astronomique à bord d'avion. L'Aéronautique, Paris, Sep. 1934, v. 16, no. 184, p. 73-81. illus.

Instructions for the aircraft navigational plotting boards, mark I and mark II, Bureau of aeronautics, U. S. Navy, by Philip Dalton. Washington, 1934. 15 p. diagrs.

## DEAD RECKONING - CALCULATORS

Instructions for the aircraft navigational computer, mark VII, Bureau of aeronautics, U. S. Navy, by Philip Dalton. Washington, 1934. 23 p. diagrs.

A Simple course calculator, by W. G. Pye. Aircraft, Melbourne, Nov. 1933, v. 12, no. 2, p. 7, 27. illus.

Easy course calculator. Flight, London, Sep. 7, 1933, v. 25, no. 36, p. 893.

Navigation by slide-rule, by Philip V. H. Weems. Popular aviation, Chicago, Sep. 1933, v. 13, no. 3, p. 167, 209. diagrs.

L'Aiutante di pilotaggio, di Corrado Gustosa. Rivista aeronautica, Roma, May 1933, v. 9, p. 214-262. diagrs., illus.

Le Calculateur de cap et de vitesses vraies Dentan, type C.I.D.N.A. L'Aéronautique, Paris, Feb. 1932, v. 14, no. 153, p. 45-47. diagrs.

Navigation à la slide rule, by Frank Hawks. Western flying, Los Angeles, Cal., Dec. 1931, v. 10, no. 6, p. 33. illus.

Il Calcolatore "du Cluzel." Rivista aeronautica, Roma, Mar. 1931, v. 7, no. 3, p. 535-40. illus.

Calculating instrument for aerial navigation. Aero digest, New York, Mar. 1931, v. 18, p. 58. illus.

Indicatore di rotta Goerz-Clementi. Rivista aeronautica, Roma, Mar. 1931, v. 7, no. 3, p. 534-35. illus.

The Mechanical course and distance computer, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 120-29. charts, diagrs.)

Un Nouvel instrument de navigation: le calculateur du Cluzel. L'Aéronautique, Paris, Nov. 1930, v. 12, no. 138, p. 401-02. illus.

Navigators triangulator based on the slide rule. Airway age, East Stroudsburg, Pa., Nov. 1929, v. 10, p. 1836. diagr.

The Addison-Luard calculator. Flight, London, Sep. 27, Oct. 25, 1929, v. 21, p. 70-71, 77-79. diagrs., illus.

A New line of position plotter, by H. T. Stetson. U. S. Naval institute proceedings, Menasha, Wis., June 1929, v. 55, no. 316, p. 521-23. illus.

## AIR NAVIGATION

Hughes-Waage course corrector. Flight, London, May 16, 1929, v. 21, no. 20, p. 403-04. illus.

Une Machine à calculer le point-système Le Sort. L'Aérophile, Paris, Mar. 1-15, 1929, v. 37, no. 5-6, p. 79-80. illus., plans.

Cylindrical slide rules for aviators and navigators, by Armistead Rust. U.S. Naval institute proceedings, Menasha, Wis., Aug. 1928, v. 54, no. 8, p. 667-74. illus.

Un Traceur de route pour aéronef: l'autoestimographe Mengden, par P. Grenier. L'Aéronautique, Paris, Jan. 1927, v. 9, no. 92, p. 7-8. illus.

The "Navigraph," by Ives Le Prieur. Washington, 1925. 10 p. illus. (N.A.C.A. Technical memorandums no. 320) (From L'Illustration, Paris, Apr. 4, 1925)

Air distance recorder for airplanes. Popular mechanics, Chicago, Feb. 1923, v. 39, p. 266-67. illus.

Navigational equipment for long-distance flight, by H. E. Wimperis. (In International air congress report for 1923. London, 1923, p. 756-65. diagrs., illus., maps)

Les Essais en vol des avions nouveaux au service technique de l'aéronautique, (navigraph), par A. Lesage. Le Génie civil, Paris, July 22, 1922, v. 81, p. 83-87. diagrs., illus.

A Position line slide rule. Engineer, London, Mar. 3, 1922, v. 133, no. 3453, p. 250. illus. (Bygrave slide rule described)

Le Correcteur de route, par Yves Le Prieur. L'Aéronautique, Paris, Nov.-Dec. 1920, v. 2, no. 18, p. 227-32. illus. (Also L'Aérophile, Paris, Nov. 1-15, 1920, v. 28, no. 22-23, p. 326-32 and Le Génie civil, Paris, Nov. 6, 1920, v. 77, p. 378)

Le Cercle calculateur de routes et de vitesses, par A. B. Duval. L'Aéronautique, Paris, Sep. 1920, v. 2, no. 16, p. 155-57. illus.

New computers for aeroplane work. Aerial age, New York, Feb. 16, 1920, v. 10, no. 18, p. 666. illus.

Navigation instruments. Aeronautics, London, Dec. 11, 1919, v. 17, no. 321, p. 527. diagrs.

## DEAD RECKONING - CALCULATORS

New navigating instruments made for transatlantic flight (course and distance indicator) S.A.E. journal, New York, July 1919, v. 5, no. 1, p. 77. (Also Automotive industries, Philadelphia, Pa., May 22, 1919, v. 40, p. 1135)

## MAPS AND CHARTS

Orientation and landfall by precomputed curves, by William C. Bentley. Aero digest, New York, Aug. 1938, v. 33, no. 2, p. 92-95. diagrs.

Special maps for use with loop direction finders, by James M. Coburn, Jr. Journal of the aeronautical sciences, New York, Apr. 1938, v. 5, no. 6, p. 233-36. illus., map.

La Formazione rapida ed economica del navigatore completo, di Valentino Pivetti. Rivista aeronautica, Roma, Jan.-Feb. 1938, v. 14, no. 1-2, p. 36-52; 256-69.

Le Carte per la navigazione oceanica, di R. Grasso. L'Ala d'Italia, Milano, Jan. 1938, v. 14, p. 19-24. maps.

Finding your way in the air, by Philip V. H. Weems. Aviation, New York, Jan. 1938, v. 37, no. 1, p. 28-29. illus.

Maps and charts, by C. W. Martin. (In his Martin's air navigation. London, The Eversley press, ltd., 1938. p. 44-72)

Practical air navigation and the use of the aeronautical charts of the U.S. Coast and geodetic survey, by T. C. Lyon. Washington, U.S. Govt. print. off., 1938. 185 p. diagrs., maps, plates.

Avigation, by Hubert S. Huntington. Aero digest, New York, Nov. 1937, v. 11, no. 5, p. 530, 532. chart.

Maps and charts, by Philip V. H. Weems. (In his Air navigation. London; New York, McGraw-Hill publishing company, ltd., 1937. p. 15-47. diagrs., illus.)

Maps and chart projections, by D. C. T. Bennett. (In his The Complete air navigator. London, Sir Isaac Pitman and sons, ltd., 1937. p. 56-79. diagrs., tables)

Maps, map reading and charts. Great Britain. Air ministry. (In Manual of air navigation. London, H. M. Stat. off., 1935. p. 11-37. diagrs.) (Air publication no. 1234)

## AIR NAVIGATION

Navigation tables for mariners and aviators, by Joseph Young Dreisonstok. Washington, U.S. Govt. print. off., 1935. 111 p. tables. (Hydrographic office publication no. 208)

Practical air navigation and the use of the aeronautical charts of the Department of commerce, by Thoburn C. Lyon. Washington, U.S. Govt. print. off., 1935. 63 p. diagrs., illus., maps. (Special publication no. 197)

Use of maps, by Frank Wilbur Wead and James Ross Allen. (In their Practical flying and meteorology. Scranton, Pa., International text book company, 1935. p. 1-18. diagrs., maps)

New ideas on air navigation, by Philip V. H. Weems. Popular aviation, Chicago, Mar. 1934, v. 14, p. 168. table.

I.C.S. altitude and azimuth tables for air and sea navigation. Scranton, Pa., International textbook company, 1934. 91 p.

Une Utilisation de la projection stéréographique, pour la navigation aérienne, par J. F. Cox. L'Aéronautique, Paris, Nov. 1933, v. 174, p. 109-110. diagrs.

Carte e mezzi ausiliari per la navigazione ortodromica con speciale riguardo alla navigazione aerea, di G. Forni. Rivista marittima, Roma, June 1933, v. 66, no. 6, p. 171-80.

Air navigation, by Norman MacMillan. Journal of the R.A.S., London, Apr. 1933, v. 37, no. 268, p. 307-45. illus.

Finding the way in the air, by G. W. Ferguson. Air and airways, London, Apr. 1933, v. 10, no. 1, p. 27-28. diagrs.

Wrinkle in navigation, by J. Kruttschnitt. Western flying, Los Angeles, Cal., Apr. 1933, p. 11.

Cartografia e navigazione. Rivista aeronautica, Roma, Feb. 1933, v. 9, no. 2, p. 345-58. diagrs.

Determinazione del punto nelle regioni polari, di G. Neumayer. Rivista aeronautica, Roma, Feb. 1933, v. 8, p. 263-78. diagrs., tables.

Experimental air navigation map, by O. M. Miller. Geographical review, New York, Jan. 1933, p. 48-60.

Maps for air navigation, by Harry Harmon Blee. Aero digest, New York, Jan. 1933, v. 22, p. 15-16.

## MAPS AND CHARTS

Circa la possibilità di un più ampio sviluppo nell'uso della proiezione gnomonica per il tracciamento dell'ortodromia, di N. Galante. L'Aerotecnica, Roma, June 1932, v. 12, no. 6, p. 889-96. diagrs.

"Kahn" system of map projection, by P. Dupuy. Aircraft engineering, London, Mar. 1931, v. 3, no. 25, p. 57-60. illus.

Air navigation maps. U.S. Department of commerce. Aeronautics branch. Washington, U.S. Govt. print. off., 1931. 13 p. maps. (Aeronautics bulletin no. 10)

Avigation maps and charts, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 11-31. charts, maps)

Map projection, by Oliver Stewart. (In his Cross country flying, London, Constable and company, ltd., 1931. p. 7-21. diagrs., illus.)

Map reading and projection, by Frank Arthur Swoffer. (In his Air navigation for the private owner. London, Sir Isaac Pitman and sons, ltd., 1931. p. 1-40. diagrs., maps, tables)

Maps and charts, by Bradley Jones. (In his Avigation. New York, John Wiley and sons, 1931. p. 43-52. charts, diagrs.)

Maps and charts, by Leslie S. Potter. (In his The Navigation of the air and meteorology. New York; London, Harper and brothers, 1931. p. 18-38. charts, maps)

Position tables for aerial and surface navigation. Washington, U.S. Govt. print. off., 1931. 223 p. diagrs., tables. (Hydrographic office publication no. 209)

Les Grands intineraires aériens et les cartes actuelles, par R. Galmard. La Technique moderne, Paris, Nov. 1, 1930, v. 22, no. 21.

Compiling aerial maps, by Mel S. Kennedy. Western flying, Los Angeles, Cal., July 1930, v. 8, no. 1, p. 45-47. illus.

Carte aeronautiche internazionali. Segni, simboli ed abbreviazioni convenzionali, di Renato Grasso. Rivista aeronautica, Roma, May 1930, v. 6, no. 5, p. 241-64. illus., tables.

Over the hills and far away, by Lewis A. Yancey. Aero news and mechanics, New York, Apr.-May 1930, v. 2, no. 2, p. 13-15, 80. diagrs., illus., maps.

Les Cartes aéronautiques. Nouvelle méthode de navigation aérienne. L'Aérophile, Paris, Apr. 15, 1930, v. 38, no. 7-8, p. 103-06. maps.

Aerial navigation - maps and chart reading, by Douglas G. Jeffrey. Aeronautics, Chicago, Mar. 1930, v. 6, no. 3, p. 39-40, 48, 50. illus.

Aerial navigation - Mercator chart, by Douglas G. Jeffrey. Aeronautics, Chicago, Feb. 1930, v. 6, no. 2, p. 43-44, 82, 85. illus.

Aerial pathfinding, by Lewis A. Yancey. Aero news and mechanics, New York, Feb. 1930, v. 2, no. 1, p. 7-9, 85, 96. illus.

Aerial navigation, by Douglas G. Jeffrey. Aeronautics, Chicago, Oct.-Nov. 1929, v. 5, no. 4-5, p. 29-30, 48, 50, 58, 80. illus.

Aerial plotting charts, by Philip V. H. Weems. Aero digest, New York, Nov. 1929, v. 15, no. 5, p. 78, 259-60. charts.

New Hydrographic office flying charts. Air commerce bulletin, Washington, Sep. 15, 1929, v. 1, no. 6, p. 10.

Navigation without calculation, by Philip V. H. Weems. Airway age, East Stroudsburg, Pa., Sep. 1929, v. 10, no. 9, p. 1404-06. diagrs.

How and why of navigation. Distance and direction, maps and courses, construction of maps, by George R. Fairlamb, Jr. Airway age, East Stroudsburg, Pa., June 1929, v. 10, no. 6, p. 821-25.

Sectional air maps. Domestic air news, Washington, Apr. 30, 1929, no. 51, p. 10.

Air navigation maps, by Douglas W. Clephane. Aero digest, New York, Feb. 1929, v. 14, no. 2, p. 52-53, 212. diagrs., illus.

Sectional area air maps to replace "strip" maps. Domestic air news, Washington, Jan. 15, 1929, no. 44, p. 4-6.

Charts and maps, by Lewis A. Yancey. (In his Aerial navigation and meteorology. New York, The Norman W. Henley publishing company, 1929. p. 26-44. charts, diagrs., maps.

List of air navigation charts. U.S. Department of commerce. Aeronautics branch. Washington, U.S. Print. off., 1929. 7 p. maps. (Aeronautics bulletin no. 10)

## MAPS AND CHARTS

Maps, instruments and accessories, by Logan C. Ramsey. (In his Navigation of aircraft. New York, The Ronald press company, 1929. p. 15-28. chart, illus.)

Avigation, by Philip V. H. Weems. Popular aviation, New York, May, Sep. 1928, v. 2-3, p. 38-40, 42; 35-36. illus.

Better navigation, by H. V. Wiley. Aviation, New York, Jan. 9, 1928, v. 24, no. 2, p. 96-97.

Star altitude curves for obtaining a fix, given only the Greenwich siderial time and the observed altitudes of two stars. The use of the dead reckoning position, declination, right ascension, hour angle and azimuth is eliminated. Latitude 30° to 41° north, by Philip V. H. Weems. San Diego, Cal., Rodney Stokes company, 1928. 44 p.

Modern methods in sea and air navigation, by Radler de Aquino. U.S. Naval institute proceedings, Menasha, Wis., Jan. 1927, v. 53, no. 1, p. 17-34. diagrs., tables.

Practical navigation of aircraft, by F. Tymms. Journal of the R.A.S., London, May 1925, v. 29, no. 173, p. 202-39. illus. (Also Flight, London, Mar. 26, 1925, v. 17, no. 13, p. 192)

Sulla determinazione della posizione geografica dell'aeromobile, di N. Galante. Rendiconti tecnici della Direzione superiore del genio e delle costruzioni aeronautiche, Roma, Mar. 15, 1925, v. 13, n o. 3, p. 32-39. diagrs.

Aeronautical charts, by Story B. Ladd. Aerial age weekly, New York, Apr. 17, 1922, v. 15, no. 6, p. 126-27.

Graphiques destinés à la détermination des routes orthodromiques, sur la projection de Mercator, par L. Favé. C. R. Acad. sci., Paris, Jan. 31, 1921, v. 172, no. 5, p. 252-54.

Aerial navigation instructions - provisional. Washington, U.S. Govt. print. off., 1920. 44 p. diagrs., maps, tables. (Air service information circular no. 82)

Davis' sun's true bearing or azimuth tables 30°N - 30°S, by Perry L. H. Davis and John E. Davis. London, J. D. Potter, 1920.

The World's air and ocean routes, Mercator's charts, by B. J. S. Cahill. Pacific marine review, San Francisco, Cal., Aug. 1919, v. 16, no. 8, p. 90-92. illus.

## AIR NAVIGATION

The Chart as a means of finding geographical position by observations of celestial bodies in aerial and marine navigation, by G. W. Littlehales. U.S. Naval institute proceedings, Menasha, Wis., Mar. 1918, v. 44, p. 567-81. maps, tables.

Altitude, azimuth and line of position tables. Washington, U.S. Govt. print. off., 1918. (Hydrographic office publication no. 200)

Davis "ex-meridian" tables with supplementary azimuths, by Percy L. H. Davis. London, J. D. Potter, 1918.

Practical tables for navigators and aviators, containing new and rapid methods for finding the longitude, azimuth and latitude and for great circle sailing, the identification of stars and for plotting line of position by the Sumner and Marcq Saint-Hilaire methods, by Armistead Rust. Philadelphia, J. E. Hand and sons, company, 1918. 116 p. diagrs., tables.

Davis' star azimuth tables 30°N, to 30°S, by Percy L. H. Davis. London, J. D. Potter, 1914.

Tafeln zur astronomischen ortsbestimmung, von Arnold Kohlschütter. Berlin, J. Springer, 1913. 3 p. chart, tables.

Carte et repéres aéronautiques, par Charles Lallemande. Revue générale des sciences, Paris, July 30, 1911, v. 22, no. 14, p. 557-62. charts.

How to find your way in the air. Aeronautical signals; aeronautic charts; steering by compass. Scientific american, New York, July 8, 1911, v. 105, no. 2, p. 24-26. illus.

La Boussole et les cartes en aéronavigation. L'Aérophile, Paris, July 15, 1910, v. 18, no. 14, p. 326-27. diagrs.

## PILOTAGE

La Formazione rapida ed economica del navigatore completo, di Valentino Pivetti. Rivista aeronautica, Roma, Jan.-Feb. 1938, v. 14, no. 1-2, p. 36-52, 256-69.

Finding your way in the air. Part I - Air pilotage, by Philip V. H. Weems. Aviation, New York, June 1937, v. 36, p. 26-27. diagrs., illus.

Air pilotage, by Philip V. H. Weems. (In his Air navigation. London; New York, McGraw-Hill publishing company, ltd., 1937. p. 97-103. diagrs., illus.

# PILOTAGE

Some early experiences in cloud-flying and navigation. Aeroplane, London, Mar. 20, 1935, v. 48, p. 322-24.

Position, direction and distance on the earth's surface. Great Britain. Air ministry. (In Manual of air navigation. London, H. M. Stat. off., 1935. p. 1-10, 49-63. diagrs., map, tables) (Air publication no. 1234)

Air navigation for the sportsman pilot. Aircraft, Melbourne, Nov. 1, 1934, v. 13, no. 2, p. 17-18. diagrs.

Across country. Flight, London, Aug. 23, 1934, v. 26, p. 868-69. diagrs.

Cross-country flying, by Frank Vivian Monk and H. T. Winter. (In their How the airman finds his way. London; Glasgow, Blackie and son, 1934. p. 7-22. diagrs., maps)

La Navigation du touriste aérien, par Albert Duval. L'Aérophile, Paris, Sep. 1933, v. 41, no. 9, p. 266-71. tables.

Aids to air navigation, by G. W. Ferguson. Air and airways, London, June 1933, v. 10, no. 3, p. 97-98. diagrs.

Navigation for the dub, by Ralph S. Barnaby. U. S. Air services, Washington, May 1933, v. 18, no. 5, p. 14-19. diagrs., illus.

Finding the way in the air, by G. W. Ferguson. Air and airways, London, Apr. 1933, v. 10, no. 1, p. 27-28. diagrs.

Tips on cross-country flying, by Frederick S. Andrews. Popular aviation, Chicago, Mar. 1933, v. 12, no. 3, p. 165-66.

Cross-country flying, by A. Duncan. Air and airways, London, Jan. 1933, v. 9, no. 10, p. 341-42. illus.

Air navigation. Flight, London, Oct. 13, 1932, v. 24, p. 967-68. (Also Aeroplane, London, Oct. 12, 1932, v. 43, p. 693-94)

How of hopping hither and yon, by Frank Williams. Sportsman pilot, New York, Feb. 1932, v. 7, no. 2, p. 12, 42.

Know your way around, by L. D. Webb. U.S. Air services, Washington, Sep. 1931, v. 16, no. 9, p. 11-14. illus.

Piloting, by Peter H. Redpath. Aeronautical world, Los Angeles, Cal., May 1931, v. 4, no. 5, p. 21, 49. diagr.

Ortsbezeichnung zur luftorientierung, von O. Ebert. Die Umschau, Frankfurt, a. M., Apr. 4, 1931, v. 35, no. 14, p. 271. illus.

Piloting - navigation - orientation, by B. Sterligov. Vestnik vozdushnovo flota, Moscow, 1931, no. 2, p. 10-12,

A Summary of procedure in the combined practice of air pilotage and dead reckoning, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 172-86. diagrs., illus.)

Simple way to post your course, by C. W. Purcell. Popular aviation, Chicago, Sep. 1930, v. 7, no. 2, p. 31-32. diagrs.

Getting where you're going, by C. F. Lienesch. Aeronautics, Chicago, June 1930, v. 6, no. 6, p. 459-60, 496. illus..

Avigation for amateurs, by Lewis A. Yancey. Sportsman pilot, New York, Nov.-Dec. 1929, Jan.-Feb., Apr.-May, 1930, v. 2-3, p. 47, 55; 47, 55; 38, 51; 54, 67; 48, 60; 48, 53.

How Lindbergh flies. "Many flyers are really "lost" a good part of the time," by Philip V. H. Weems. Western flying, Los Angeles, Cal., Mar. 1930, v. 7, no. 3, p. 54-55. illus.

Sky pilotage, by Douglas G. Jeffrey. Aeronautics, New York, July 1929, v. 5, no. 1, p. 62, 65-66, 68, 88-89. illus.

Aerial navigation for the novice. Determining position by referring to fixed objects on earth and radio beacons, by Douglas G. Jeffrey. Popular aviation, Chicago, Apr. 1929, v. 4, no. 4, p. 31, 34, 94. illus.

Cross-country work, by Lewis A. Yancey. (In his Aerial navigation and meteorology. New York, The Norman W. Henley publishing company, 1929. p. 136-62. diagrs., illus., tables)

Piloting, by Logan C. Ramsey. (In his The Navigation of aircraft. New York, The Ronald press company, 1929. p. 97-106)

Flying through fog and night, by E. T. Allen. Aviation, New York, Nov. 21, 1927, v. 23, no. 21, p. 1234-39.

Navigation piloting. Slipstream, Dayton, Ohio, Oct. 1927, v. 8, no. 10, p. 9.

Probleme der terrestrischen navigation im luftfahrzeuge, von D. H. Boykow. (In Arbeiten zur luftnavigierung. München und Berlin, R. Oldenbourg, 1927. p. 33-39)

## PILOTAGE

How I fly at night, by W. L. Smith. S.A.E. journal, New York, Sep. 1926, v. 19, no. 3, p. 228-33. illus.

Methods of sea and air navigation, by J. P. Ault. Scientific monthly, New York, Jan. 1926, v. 22, p. 60-63.

Sulla determinazione della posizione geografica dell'aeromobile, di N. Galante. Rendiconti tecnici della direzione superiore del genio e costruzioni aeronautiche, Roma, Mar. 15, 1925, v. 13, no. 3, p. 32-39. diagrs.

Geology as an aid to air navigation, by M. G. Christie. Aviation, New York, June 4, 1923, v. 14, no. 23, p. 609-11.

Ortsbestimmungen. A. Terrestrische ortsbestimmung. B. Astronomische ortsbestimmung. C. Funkentelegraphische ortsbestimmung, von A. Wedemeyer und O. Nairz. (In Moedebecks taschenbuch für flugtechniker und luftschiffer. Berlin, 1923, p. 308-63. diagrs., illus.)

Une Solution du problème de l'orientation en avion. L'Industrie électrique, Paris, Jan. 25, 1922, v. 31, no. 710, p. 25-27. diagrs.

Der Flugzeugkompass und seine handhabung; kompasskompensierenkursabsetzen, von Fritz Gansberg. Berlin, M. Krayn, 1915. 43 p. diagr.

Orientamento in aeroplano. Annuario dell'aeronautica (Touring club italiano), Milano, 1913, p. 427; 1914, p. 447; 1915, p. 437.

Die Orientierung in der luft. Fachzeitung für automobilismus und flugtechnik, Berlin, Sep. 21-28, 1913, v. 7, no. 38-39, p. 12-14; 13-14.

Efectos del viento sobre la marcha del aeroplano, por Raul Goubat. Boletín del aero club Argentino, Buenos Aires, June 1913, v. 3, no. 14, p. 338-39. diagrs.

Orientierung der luft. Deutsche luftfahrer zeitschrift, Berlin, May 14, 1913, v. 17, no. 10, p. 241. illus.

Orientierung und navigation im luftfahrzeug, von D.H. Boykow. Deutsche luftfahrer zeitschrift, Berlin, Oct. 24, 1912, v. 16, no. 22, p. 530-34. diagrs., illus.

Orientierung auf überlandflügen auf grund praktischer erfahrungen, von Hans Steffen. Berlin, R. Eisenschmidt, 1912. 54 p. diagrs., illus., maps.

Die Frage der fliegerorientierung und die internationale luftschifferkarte, von Fritz Edelstein. Fachzeitung für automobilismus und flugtechnik, Berlin, Oct. 12-22, 1911, v. 5, no. 41-43, p. 36-40; 49-54; 58-60. diagrs.

AIR NAVIGATION

How to find your way in the air. Aeronautical signals; aeronautic charts; steering by compass. Scientific american, New York, July 8, 1911, v. 105, no. 2, p. 24-26. illus.

Orientierung beim rundflug. Deutsche zeitschrift für luftschiffahrt, Berlin, June 14, 1911, v. 15, no. 12, p. 16-18. illus.

Steering by compass, by Eric H. Clift. Flight, London, May 13, 1911, v. 3, no. 19, p. 429. diagr.

Steering by compass, by F. R. Barlow. Flight, London, May 13, 1911, v. 3, no. 19, p. 428-29. diagr.

Steering by compass. Flight, London, May 6, 1911, v. 3, no. 18, p. 409.

Steering by compass, by L. Graham Davies. Flight, London, Sep. 24, 1910, May 6, 1911, v. 2-3, p. 775-76; 409. diagr.

L'Orientation en Allemagne. La Conquête de l'air, Bruxelles, Mar. 1, 1911, v. 8, no. 5, p. 5.

Le Problème de l'orientation. La Conquête de l'air, Bruxelles, Feb. 15, 1911, v. 8, no. 4, p. 3.

Comment reconnaître son chemin? Revue de l'aviation, Paris, Dec. 1, 1910, v. 5, no. 49, p. 263-68. illus.

Zur benutzung der kompasses im ballon, von A. Bestelmeyer. Deutsche zeitschrift für luftschiffahrt, Berlin, Nov. 30, 1910, v. 10, no. 24, p. 17-18.

La Boussole et les cartes en aéronavigation. L'Aérophile, Paris, July 15, 1910, v. 18, no. 14, p. 326-27. diagrs.

De l'orientation dans l'air. Revue de l'aviation, Paris, July 1, 1910, v. 5, no. 44, p. 146-47.

Neuer beitrag zur frage der ortsbestimmung in der luft, von Adolf Marcuse. Illustrierte aeronautische mitteilungen, Berlin, Nov. 3, 1909, v. 13, no. 22, p. 984.

Uber die magnetische ortsbestimmung im ballon, von Bidlingmaier. Illustrierte aeronautische mitteilungen, Berlin, Nov. 3, 1909, v. 13, no. 22, p. 975-83. illus.

## RADIO POSITION FINDING

Radio direction finding on wave lengths between 6 and 10 meters, by R. L. Smith-Rose and H. G. Hopkins. Journal of the Institution of electrical engineers, London, July 20, 1938, v. 83, no. 499, p. 87-97.

Federal avigation aids. Radio news, Chicago, June 1938, v. 19, p. 40-43. illus.

Special maps for use with loop direction finders, by James M. Coburn, Jr. Journal of the aeronautical sciences, New York, Apr. 1938, v. 5, no. 6, p. 233-36. illus., map.

Radio compass navigation, by R. G. Nichols. Air commerce bulletin, Washington, Mar. 15, 1938, v. 9, no. 9, p. 203-12. diagrs., illus.

Le Système européen des triangles de radiophares pour le guidage radiogoniométrique des aéronefs, par A. Taranger. Revue aéronautique internationale, Paris, Mar. 1938. 8 p. map., tables.

Homing vs. crabbing flight, by W. R. Weems. Aero digest, New York, Feb. 1938, v. 32, no. 2, p. 34, 36. diagrs.

Radio network and practice of Pan-american airways, by Henry W. Roberts. Aero digest, New York, Jan.-Feb. 1938, v. 32, p. 32, 34, 48, 50. illus., map.

Funkpeilverfahren der reichsflugsicherung, von O. Heer. Zeitschrift des V.D.I., Berlin, Jan. 15, 1938, v. 82, no. 3, p. 66-70. diagrs., illus.

Aircraft radio; new equipment for communication and navigation, by Henney and Fink. Aviation, New York, Nov. 1937, v. 36, no. 11, p. 44-45. illus.

Les Applications de la radio-électricité à la navigation aérienne. Journal des télécommunications, Berne, Nov. 1937, v. 4, no. 11, p. 301-07.

Ultra-short waves for air navigation, by Henry W. Roberts. Aero digest, New York, Nov. 1937, v. 31, p. 66, 71. diagrs.

Navigation with loop antennas, by Henry W. Roberts. Aero digest, New York, Sep. 1937, v. 31, p. 72, 74. diagrs.

Impuls-peilung, von H. Plendl. Hochfrequenztechnik und electroakustik, Frankfurt, Aug. 1937, v. 50, no. 2, p. 37-41. (Also Luftfahrtforschung, München, Oct. 12, 1936, v. 13, no. 10, p. 367-70)

Running fix. Flight, London, July 1, 1937, v. 32, no. 1488, p. 38.

Flying the radio ranges, by Henry W. Roberts. Aero digest, New York, July 1937, v. 31, p. 52, 55, 58. diagrs.

Position finding and course plotting on board aeroplane by means of radio. Philips technical revue, Eindhoven, Holland, June 1937, v. 2, no. 6, p. 184-90.

Experimentelle untersuchungen über maximum-peilverfahren, von Hans Failer. Luftfahrtforschung, München, Mar. 20, 1937, v. 14, no. 3, p. 148-52. diagrs., illus.

La Radionavigation, par F. Perrin. L'Air, Paris, Mar. 20, 1937. 3 p. illus.

Practical aspects of radio navigation of aircraft, by Henry W. Roberts. Aero digest, New York, Feb. 1937, v. 30, p. 56, 58. diagrs., illus.

Verfahren und geräte der luftnavigation, von Oswald Schmidt. Feinmechanik und präzision, Leipzig, Feb. 1937, v. 45, no. 2, p. 17-20. illus.

Radio air navigation, by R. Denman. Flight, London, Jan. 21, 1937, p. 54-56. illus.

Le Radio-compas et ses applications à la navigation aérienne, par H. Busignies. L'Aérophile, Paris, Nov. 1936, Jan. 1937, v. 44-45, p. 256-59; 14-20. diagrs., illus. (Translated Electrical communication, New York, Oct. 1936, v. 15, no. 2, p. 157-72) (Abstracts Nature, London, Apr. 10, 1937, v. 139, p. 642 and Communication and broadcast engineering, New York, Jan. 1937, v. 4, no. 1 p. 10-11, 21, 25)

Aeronautic radio. U.S. Bureau of air commerce. Washington, U.S. Govt. print. off., 1937. 43 p. diagrs., illus. (Aeronautics bulletin no. 27)

Direction finding wireless and signals, by D. C. T. Bennett. (In his The Complete air navigator. London, Sir Isaac Pitman and sons, ltd., 1937. p. 129-47. diagrs., tables)

Radio navigation, by Philip V. H. Weems. (In his Air navigation. London; New York, McGraw-Hill publishing company, ltd., 1937. p. 192-226. diagrs., illus.)

La Navigation aérienne avec un radiocompas, par J. L. Houssin. L'Aéronautique, Paris, Dec. 1936, v. 18, no. 211, p. 323-29. illus.

Le Rôle de la radioélectricité en aviation, par P. Franck. La Technique moderne, Paris, Nov. 15, 1936, v. 28, no. 22, p. 775-82.

La Réduction de l'erreur nocturne en radio-goniométrie par le collecteur d'onde Adcock, par H. Busignies. Le Génie civil, Paris, July 11, 1936, v. 109, p. 48.

Training pilots to fly the beam, by A. F. Bonnalie. Scientific american, New York, June 1936, v. 154, no. 6, p. 322-24. illus.

Eigenfunkpeilung azimutgleichen, von W. Frotscher. Annalen der hydrographie und maritimen meteorologie, Berlin, May 1936, v. 64, no. 5, p. 213-15. diagrs., illus., tables.

Radio for the charter pilot. Flight, London, Apr. 9, 1936, v. 29, no. 1424, p. 383.

Considérations sur le lever du doute en radiogoniométrie, par H. Bellini. L'Onde électrique, Paris, Apr. 1936, v. 15, no. 172, p. 254-57.

Déviations radiogoniométriques à bord d'avion, par E. Fromy. L'Onde électrique, Paris, Feb.-Apr. 1936, v. 15, no. 170-172, p. 113-32; 168-81; 245-53. diagrs., tables.

Flying the Pacific by radio; Pan-american airways. Electronics, New York, Apr. 1936, v. 9, no. 4, p. 7-10. illus., maps.

Le Planisphère de Mercator et la navigation maritime ou aérienne par relèvement radiogoniométrique pris du bord, par L. Driencourt. Revue aéronautique internationale, Paris, Mar. 1936, v. 6, no. 19, p. 75-79. diagrs.

Il Radiogoniometro sui velivoli, di Alfonso Lidonnici. Rivista aeronautica, Milano, Mar. 1936, v. 12, no. 3, p. 319-27. diagrs., illus.

Wireless and its application to commercial aviation, by J. M. Furnival. Journal of the R.A.S., London, Mar. 1936, v. 40, no. 303, p. 159-88, 188-97. (Also Flight, London, Dec. 26, 1935, v. 28, no. 1409, p. 671-75 and Aeroplane, London, Dec. 24, 1935, v. 49, no. 1283, p. 778-79)

Recent developments in Marconi-Adcock direction finding, by S. B. Smith and G. F. Hatch. Marconi revue, London, Jan.-Feb. 1936, no. 58, p. 1-14. diagrs., tables.

## AIR NAVIGATION

Flying by radio, by J. P. De Wet. Canadian mining journal, Toronto, Jan. 1936, v. 57, no. 1, p. 26-27.

Navigation et radiogoniométrie, par P. Boutet. Revue du Ministère de l'air, Paris, Dec. 15, 1935, v. 1, no. 12, p. 1565-95. diagrs., illus.

The Telefunken radiogonimetric impulse system. Interavia, Geneva, Oct. 7, 1935, p. 3. diagrs., illus.

Lo Sviluppo cilindrico isogonico inversa nei problemi di radio-navigazione, di N. Galante. Rivista aeronautica, Roma, July 1935, v. 11, no. 7, p. 7-14.

The Latest aid to avigation. Aeroplane, London, June 5, 1935, v. 47, no. 1254, p. 668. diagrs., illus. (RC34 direction finder and its use)

Instrument and radio flying, by E. A. Cutrell. Aviation, New York, June 1935, v. 34, p. 11-14. diagrs., illus.

Radio compass found suitable for oceanic air navigation in tests over Pacific. Air commerce bulletin, Washington Apr. 15, 1935, v. 6, p. 215-17.

Scattering, polarisation errors and the accuracy of short wave direction finding, by T. L. Eckersley. Marconi revue, London, Mar.-Apr. 1935, no. 53, p. 1-8. diagrs.

Flying by wireless, by R. Denman. Airways and airports, London, Jan. 1935, p. 368-72.

Direction finding wireless telegraphy. Great Britain. Air ministry. (In Manual of air navigation. London, H. M. Stat. off., 1935. p. 197-209. charts, diagrs., tables.) (Air publication no. 1234)

Flugfunkpeilwesen und funknavigation, von Rudolf Grötsch. Berlin-Tempelhof, Deutsche radio bücherei, J. Schneider, 1935. 95 p.

Impuls-peilanlage - Telefunken. Interavia, Geneva, 1935, no. 259, p. 1-2. diagrs.

Radio aids to overland air navigation, by Arthur Reinhold Nelson and J. L. Hornung. (In their Practical radio communication. New York, McGraw-Hill book company, 1935. p. 560-74. diagrs., illus.)

Use of radio in aeronautics, by Frank Wilbur Wead and James Ross Allen. (In their Practical flying and meteorology. Scranton, Pa., International text book company, 1935. p. 51-57. diagrs.)

## RADIO POSITION FINDING

Experimentelle untersuchungen des beim funkpeilen störenden nachteffekts, von A. Hagen. Hochfrequenztechnik und elektroakustik, Frankfurt, Dec. 1934, v. 44, no. 6, p. 181-85. illus.

How to use the signals from any broadcasting station to guide a plane, by C. E. Planck. Radio news, New York, Nov. 1934, no. 16, p. 272. illus.

Radio marker beacon used to indicate to airmen location of radio towers. Air commerce bulletin, Washington, Nov. 1934, v. 6, p. 119-21. illus.

The Night performance of the Marconi - Adcock direction finder type D.F.G.8, by S. B. Smith. Marconi revue, London, Sep.-Oct. 1934, no. 50, p. 1-5. diagrs.

Le Radioguidage sur les lignes aux États Unis. Impressions personnelles de pilotage et de navigation. L'équipement radio-électrique du Federal airways system. L'Aéronautique, Paris, June 1934, v. 16, no. 181, p. 137-43. diagrs., map.

Air-cruising with radio, by L. H. Bowman. Western flying, Los Angeles, Cal., May 1934, v. 14, no. 5, p. 12-14.

Guidage radioélectrique des aéronefs, par F. Bardot. Revue de l'armée de l'air, Paris, Mar. 1934, no. 56, p. 265-86.

Sur l'emploi des relèvements radio-goniométriques à grande distance, par F. La Porte. C. R. Acad. sci., Paris, Jan. 29, 1934, v. 198, no. 5, p. 447-49. diagr.

Pilot, the radio and the beam, by B. Parker. Western flying, Los Angeles, Cal., Jan. 1934, v. 14, no. 1, p. 14-15.

Radio and aerial navigation, by Frank Vivian Monk and H. T. Winter. (In their How the airman finds his way. London; Glasgow, Blackie and son, 1934. p. 54-64)

Radio beams for the owner-flyer, by C. E. Planck. National aeronautic magazine, Washington, Dec. 1933, v. 11, no. 12, p. 9.

Transcontinental via radio, by H. King. Sportsman pilot, New York, Dec. 1933, p. 24-26.

Aeronautic radio on the Federal airways system. Air commerce bulletin, Washington, Nov. 15, 1933, v. 5, p. 127-33. illus.

A Method of providing course and quadrant identification with the radio range-beacon system, by Francis W. Dunmore. Bureau of standards journal of research, Washington, Sep. 1933, v. 11, no. 3, p. 309-25. diagrs.

## AIR NAVIGATION

La Radio nei collegamenti e nella guida delle rotte aeree, di G. Manisco. Rivista aeronautica, Roma, Sep. 1933, v. 9, no. 9, p. 433-74. bibliog.

Simplification of radio range-beacon position and quadrant identification. Air commerce bulletin, Washington, July 1933, no. 5, p. 2-7.

Radio aids to air navigation, by C. F. Green and H. I. Becker. Electrical engineer; New York, May 1933, v. 52, p. 307-11. diagr., illus.

Direction-finding at night. Electrical review, London, Apr. 28, 1933, v. 12, no. 2892, p. 594. (Also Electrician, London, Apr. 21, 1933, v. 110, no. 2864, p. 513)

Radiogoniométrie d'avions à cadres fixes, par Givelet. (In Congrès international de la sécurité aérienne, Paris, 1933, v. 4, p. 37-38)

Transmitteur automatique d'appels de détresse et de position. (In Congrès international de la sécurité aérienne, Paris, 1933, v. 4, p. 27)

Locating radio beacon stations, by Howard C. Stark. Aero digest, New York, Dec. 1932, v. 21, no. 6, p. 39. diagrs. (Abstract Journal of the R.A.S., London, Sep. 1933, p. 816)

Radio guidance, by J. E. Miller. Proceedings of the Institute of radio engineers, New York, Nov. 1932, v. 20, no. 11, p. 1752-62. diagrs.

Organisation du réseau radio-électrique d'une ligne aéro-maritime, par M. Serre. La Science aérienne, Paris, Sep.-Oct. 1932, p. 7.

Flying the radio ranges. Air commerce bulletin, Washington, Sep. 15, 1932, v. 4, p. 135-50. diagrs., map.

Sull'impiego della radiogoniometria nella navigazione aerea con particolare riguardo all'organizzazione delle reti RDG, terrestri, di Attilio Crotti. Rivista aeronautica, Roma, June 1932, v. 8, no. 6, p. 557-72. diagrs., illus.

Wireless direction finding as aid to air navigation, by J. A. McDonald. R.A.F. quarterly, London, Apr. 1932, v. 3, no. 2, p. 220-31. illus.

Dèviations radiogoniométriques à bord d'avion, par E. Fromy. Publications scientifiques et techniques du Ministère de l'air, Paris, 1932, no. 6, p. 1-44. diagrs. (Abstract Journal of the R.A.S., London, Jan. 1933, p. 99)

La Radiogoniométrie, par M. Mesny. Congrès international d'électricité, Paris, 1932, v. 11, sec. 9, p. 373-85. diagrs.

Jämförclse mellan olika system för navigation av flygplan medelst radio. Flygning, Stockholm, Nov. 1931, v. 9, no. 11, p. 229-30. diagr.

La Radiogoniométrie appliquée aux lignes aériennes, par M. Serre. L'Onde électrique, Paris, Oct.-Nov. 1931, v. 10, no. 118-19, p. 425-57; 513-20. diagrs.

Organisation du réseau radioélectrique d'une ligne aéro-maritime. Choix des gammes d'ondes. Organisation générale, choix du matériel. Consigne de travail en réseau. Problème de la radiogoniométrie, par M. Serre. La Technique aéronautique, Paris, Sep. 1931, n.s., v. 22, no. 119, p. 232-37.

Sur la détermination du point par la radiogoniométrie, par Ch. Bertin. C. R. Acad. sci., Paris, Aug. 31, 1931, v. 193, no. 9, p. 394.

La Radiogoniometria nella navigazione aerea, di Francesco Musella. Rivista aeronautica, Roma, Aug. 1931, v. 7, no. 8, p. 259-80. diagrs.

La Direction dans la brume par la T.S.F., par François Canac. Revue des deux mondes, Paris, Apr. 15, 1931, ser. 8, v. 2, p. 926-38. diagrs.

Le Basilage radioélectrique des alignements, par A. Blondel et P. Besson. La Technique moderne, Paris, Apr. 1931, v. 23, no. 7, p. 209-18. diagr.

The Loth system of navigation by rotating radio beacons, by John Jay Ide. U.S. Air services, Washington, Mar. 1931, v. 16, no. 3, p. 29-30. illus.

Q.R.D. South America; with the pilot radio on its record breaking flight across two continents, by Z. Bouck. Radio news, New York, Jan.-Mar. 1931, v. 12, p. 586-88; 698-700; 786-88. illus., map.

The Way home, by Gerhard R. Fisher. Western flying, Los Angeles, Cal., Mar. 1931, v. 9, no. 3, p. 26-28. illus.

La Radiogoniométrie de bord, par Guyot. Revue des forces aériennes, Paris, Feb. 1931, v. 3, p. 209-18. diagrs., illus.

Radiogoniométrie et vols de nuit. L'Antenne, Paris, Feb. 1931, v. 9, no. 410, p. 61-62.

Flugsicherung durch richtfunkbaken, von H. Rahskopff. Zeitschrift des V.D.I., Berlin, Jan. 24, 1931, v. 75, p. 116-17. diagrs., illus., map.

Aids to aerial navigation, by Frank Arthur Swoffer. (In his Air navigation for the private owner. London, Sir Isaac Pitman and sons, ltd., 1931. p. 85-101. diagrs., illus., maps, tables)

Beiträge zur flugfunkeigenpeilung, von Heinrich Gloeckner. (In Jahrbuch 1931 der D.V.L., München und Berlin, p. 672-78)

How to get the most out of your direction finder and the Kaess radio compass and direction finder. Lindenhurst, New York, Marine department, Airplane and marine direction finder corporation, 1931. 31 p. diagrs.

Meteorology and wireless, by Oliver Stewart. (In his Cross country flying. London, Constable and company, ltd., 1931. p. 97-107)

Procédés de radio alignement, par P. Besson. L'Onde électrique, Paris, 1931, v. 10, no. 117, p. 369-424.

Radio as an aid to navigation - conversion angle, by Leslie S. Potter. (In his The Navigation of the air and meteorology. New York; London, Harper and brothers, 1931. p. 88-100. diagrs., illus., map)

Radio avigation, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, 1931. p. 258-67. diagr.)

Radio navigation, by Bradley Jones. (In his Avigatioh. New York, John Wiley and sons, 1931. p. 274-80)

La Radiogoniometria e la sua applicazione nella navigazione aerea, di A. Pesamosca. L'Ala d'Italia, Milano, Dec. 1930, v. 9, no. 12, p. 987-88. diagrs.

Wireless direction finding, by C. B. Carr. Aircraft engineering, London, Dec. 1930, v. 2, no. 22, p. 305-07.

Sur un procédé de guidage des avions. L'Onde électrique, Paris, Nov. 1930, v. 9, no. 103, p. 520-26. illus.

# RADIO POSITION FINDING

Le Guidage des navires ou aéronefs par ondes dirigèes, par W. Roth. La Science moderne, Paris, July 1930, v. 7, no. 7, p. 334.

Un Importante problema di navigazione aerea. La guida dei velivoli. Rivista aeronautica, Roma, July 1930, v. 6, no. 7, p. 140-43. illus.

Flying by radio beacon, by J. R. Irwin. Radio news, New York, May 1930, v. 11, p. 1014. illus.

Les Procédés radio-électriques pour le guidage des navires et des aéronefs, par P. David. L'Onde électrique, Paris, May 1930, v. 9, no. 101, p. 197-227. illus.

Radio direction finding by transmission and reception, by R. L. Smith-Rose. Nature, London, Apr. 5-12, 1930, v. 125, no. 3153-54, p. 530-32; 568-69. illus.

Applying the radio range to the airways, by Frank Gregg Kear and W. E. Jackson. Bureau of standards journal of research, Washington, Mar. 1930, v. 4, no. 3, p. 371-81. (Also Aviation engineering, New York, Jan. 1930, p. 25-28 and Proceedings of the Institute of radio engineers, New York, Dec. 1929, v. 17, no. 12, p. 2268-82)

Radio in air-transport operation, by Herbert Hoover, Jr. S.A.E. journal, New York, Mar. 1930, v. 26, no. 3, p. 321-25, 345.

Navigazione aerea per radio. Rivista aeronautica, Roma, Feb. 1930, v. 6, no. 2, p. 334-41. illus.

Aerial navigation, by Douglas G. Jeffrey. Aeronautics, Chicago, Dec. 1929, Jan. 1930, v. 5-6, p. 39-40, 66, 68, 70; 37-38, 80. illus.

Applying the visual double-modulation type radio range to the airways, by Harry Diamond. Bureau of standards journal of research, Washington, Feb. 1930, v. 4, p. 265-87. diagrs., tables. (Also Proceedings of the Institute of radio engineers, New York, Dec. 1929, v. 17, no. 12, p. 2158-84)

The Function of aircraft radio, by Herbert Hoover, Jr. Aero digest, New York, Jan. 1930, v. 16, no. 1, p. 61-63. diagrs., illus.

Le Guidage aérien des navires et des aéronefs par les méthodes de W. Loth, par A. Bellot. Schweizer aéro revue, Zurich Jan. 1930, v. 5, no. 1, p. 9-11. illus.

## AIR NAVIGATION

Radio, a real aid to air navigation, by Herbert Hoover, Jr. Radio news, New York, Jan. 1930, v. 11, p. 596-98. illus.

Wireless aids to navigation, by F. Oddey. Telegraph and telephone, London, Jan. 1930, v. 16, no. 178, p. 72-75. illus.

Radio aids to navigation, 1930 - including details of radio-compass stations, radiobeacons, weather bulletins, storm and navigational warnings, time signals, etc. Washington, U.S. Hydrographic office, 1930. 487 p. illus.

Uber flugfunkpeilungen, von Heinrich Gloeckner. (*In* Jahrbuch 1930 der D.V.L., München und Berlin, p. 571-78. diagrs., illus.)

Le Guidage des navires ou aéronefs par ondes dirigées, par William Loth. Le Génie civil, Paris, Nov. 9, 1929, v. 95, p. 469. (*Also* C. R. Acad. sci., Paris, Oct. 28, 1929, v. 189, no. 18, p. 682-84)

Aerial navigation, by Douglas G. Jeffrey. Aeronautics, Chicago, Oct. 1929, v. 5, p. 29-30, 80. diagrs., illus.

Flying by radio, by Marjorie Driscoll and Herbert Hoover, Jr. U.S. Air service, Washington, Aug. 1929, v. 14, no. 8, p. 41-42.

Southern Cross flight a radio victory, by R. M. Heintz. Popular mechanics, Chicago, Aug. 1929, v. 50, p. 184-89. illus.

Der Schiffsort bei drei funkpeilungen, von H. Maurer. Z.F.M., München, July 31, 1929, v. 20, p. 381-84. diagrs., tables.

Die Standlinie bei der funkortung, von A. Wedemeyer. Z.F.M., München, July 31, 1929, v. 20, p. 384-87. diagr.

How and why of navigation. Cross country flying, by George R. Fairlamb, Jr. Airway age, East Stroudsburg, Pa., May 1929, v. 10, no. 5, p. 630-33.

Use of radio in safe flying, by F. C. Hingsburg. Aviation, New York, Apr. 6, 1929, v. 26, p. 1063-66. illus.

Aerial navigation for the novice. Determining position by referring to fixed objects on earth and radio beacons, by Douglas G. Jeffrey. Popular aviation, Chicago, Apr. 1929, v. 4, no. 4, p. 31, 34, 94. illus.

Direktzeigendes funkentelegraphisches peilverfahren, von Rudolf Hell. Jahrbuch der drahtlosen telegraphie und telephonie, Zeitschrift für hochfrequenztechnik, Berlin, Apr. 1929, v. 33, no. 4, p. 138-45. diagrs., illus.

## RADIO POSITION FINDING

Die Avigation und ihre mittel, von Alfried Gymnich. Luftfahrt, Berlin, Feb. 22-Mar. 7, 1929, v. 33, no. 4-5, p. 56-68; 68-71. illus.

Flugzeugsteuerung bei unsichtigem wetter, von O. Scheller. Elektrotechnische zeitschrift, Berlin, Feb. 7, 1929, v. 50, p. 191-92. diagrs.

Uses of radio as an aid to air navigation, by J. H. Dellinger. American institute of electrical engineers journal, New York, Feb. 1929, v. 48, no. 2, p. 105-09. illus.

Radio orientación de los aeroplanos. Ingeniería international, New York, Jan. 1929, v. 17, no. 1, p. 28-29. illus.

Aircraft radio and navigation, by R. Gunn. Journal of the Franklin institute, Philadelphia, June 1928, v. 205, no. 6, p. 849-63. diagrs.

Wireless position finding for aircraft. Wireless world and radio review, London, May 27, 1928, v. 10, p. 265.

Le Radio-compas et la navigation aérienne, par P. Franck. L'Onde électrique, Paris, Mar. 1928, v. 7, no. 75, p. 109-18. diagrs.

Rotating-loop radio transmitters, and their application to direction finding and navigation, by T. H. Gill and N. F. S. Hecht. Institution of electrical engineers journal, London, Mar. 1928, v. 66, p. 241-55, 274-79. (Abstracts Experimental wireless, London, Feb. 1928, v. 5, p. 85-88 and Electrician, London, Jan. 13, 1928, v. 100, p. 29)

La Navigation aérienne sans repères extérieurs. L'Aéronautique, Paris, Feb. 1928, v. 10, no. 105, p. 35-38. diagrs., illus.

Better navigation, by H. V. Wiley. Aviation, New York, Jan. 9, 1928, v. 24, no. 2, p. 96-97.

Radio direction finding, by Lawrence A. Hyland. Aviation, New York, Jan. 2, 1928, v. 24, no. 1, p. 30-33. diagr.

Navigating the ship of the air, by E. A. Hosmer. Aviation, New York, Dec. 5, 1927, v. 23, no. 23, p. 1356-57. illus.

Oversea navigation, by A. F. Hegenberger and B. Jones. S.A.E. journal, New York, Dec. 1927, v. 21, no. 6, p. 699-702. illus.

Radio direction finding, by R. L. Smith-Rose. Engineering, London, Nov. 4, 1927, v. 124, p. 587-88.

Guiding airplanes by radio beacons, by S. R. Winters. Popular aviation, Chicago, Nov. 1927, v. 1, no. 4, p. 23-26. illus.

Radio in transoceanic flight. Radio news, New York, Oct. 1927, v. 9, p. 325.

Aircraft radio navigation, by Edward F. French. Radio, San Francisco, Cal., Aug. 1927, v. 9, no. 8, p. 9. diagr., illus.

Radiogoniométrie et aviation, par Jean Vivié. Q.S.T. français et radio-électricité réunis, Paris, May 1927, v. 8, no. 38, p. 77-84. illus.

Radio in aerial navigation. Scientific american, New York, Apr. 1927, v. 136, p. 276-77. diagrs., illus.

La Direction des avions par T.S.F.: La radiogoniométrie, par P. Hémardinquer. La Nature, Paris, Mar. 15, 1927, v. 55, p. 270-72. diagrs., illus.

La T.S.F. et la navigation aérienne. La Technique aéronautique, Paris, Mar. 15, 1927, n.s., v. 18, no. 65, p. 74.

La Radiogoniométrie et la navigation, par P. Jacques. L'Aérophile, Paris, Feb. 1-15, 1927, v. 34, no. 3-4, p. 46-49. illus.

Applications of radio in air navigation, by J. H. Dellinger. Mechanical engineering, New York, Jan. 1927, v. 49, no. 1, p. 29-32. illus.

Navigational wireless, by Sidney Herbert Long. London, Chapman and Hall, ltd., 1927. 164 p. diagrs., illus., plates, tables.

Wireless direction finding and directional reception, by Ronald Keen. London, Iliffe and sons, ltd., 1927. 490 p. bibliog.

Les Radiogoniomètres et leurs applications, par G. Malgorn. Le Génie civil, Paris, Oct. 2, 9, 1926, v. 89, no. 14-15, p. 272-76, 294-97. illus.

Radio in transatlantic flight, by J. R. Irwin. Radio news, New York, Oct. 1926, v. 8, p. 348-49. illus.

Radio in the Spain-Argentina flight. Aviation, New York, May 3, 1926, v. 20, no. 18, p. 672. diagr.

Ortsbestimmungen in der luft und auf see, von P. Perlewitz. Der Luftweg, Berlin und München, Mar. 25, 1926, no. 6, p. 62-64.

## RADIO POSITION FINDING

Funkpeilungen, von August Leib und Martin Nitzsche. Berlin, E. S. Mittler und sohn, 1926. 207 p. diagrs., illus., tables.

Metodi radio-elettrici per la determinazione della rotta degli aeromobili, di M. Zonta. L'Aerotecnica, Pisa, Sep.-Oct. 1925, v. 5, no. 5, p. 289-300. illus.

Applications de la radiogoniométrie à la navigation aérienne, par P. Franck. Annales des postes, télégraphes et téléphones, Paris, June 1925, v. 14, no. 6, p. 529-47. diagrs., maps.

Practical navigation of aircraft, by F. Tymms. Journal of the R.A.S., London, May 1925, v. 29, no. 173, p. 202-39. illus. (Also Flight, London, Mar. 26, 1925, v. 17, no. 13, p. 192)

Les Procédés modernes de navigation aérienne. Le Compas Morel, navigation aérienne par radiocompas, par Fernand Collin. Le Génie civil, Paris, Mar. 28, 1925, v. 86, no. 13, p. 309-12. diagrs., illus.

The Drift of an aircraft guided towards its destination by directional receiving of radio signals transmitted from the ground, by Edward P. Warner. Washington, 1925. 5 p. diagrs., plates. (N.A.C.A. Technical notes no. 220)

Tafeln zur funkortung, von A. Wedemeyer. München und Berlin, R. Oldenbourg, 1925. 146 p. diagr.

La Radiogoniometria d'aeronautica, di A. Cabrini. L'Ala d'Italia, Milano, Dec. 1924, v. 3, no. 12, p. 274-76. diagrs., illus.

Über die genauigkeit der luftnavigierung, von J. Van der Hoop. Luftfahrt, Berlin, July 5, 1924, v. 28, no. 7, p. 116-20. diagrs.

Wireless navigation, by J. Robinson. Journal of the R.A.S., London, June 20, 1924, v. 72, no. 3735, p. 516-31. diagrs., maps.

Directional wireless telegraphy in aircraft, by C. K. Chandler. Institution of electrical engineers journal, London, July 1923-Jan. 1924, v. 61-62, p. 803-11; 129-31.

A Directive type of radio beacon and its application to navigation, by F. H. Engel and Francis Winkley Dunmore. Washington, 1924. 15 p. illus. (U.S. Bureau of standards scientific papers no. 480)

## AIR NAVIGATION

Air navigation. Part III - Radio method of position finding, by Herbert N. Eaton. U.S. Air service, Washington, Dec. 1923, v. 8, no. 12, p. 45-47.

Radio direction finding by reception. Nature, London, Nov. 10, 1923, v. 112, no. 2819, p. 690-92.

Radio-telegraphic direction finding by reception. Engineering, London, Sep. 7, 1923, v. 116, no. 3010, p. 305-07.

Finding the way in cloudland, by R. S. Wood. Wireless age, New York, Mar. 1923, v. 10, no. 6, p. 41-43. illus.

L'Emploi des méthodes de navigation est indispensable au succés des transports aériens commerciaux, par A. B. Duval. (In International air congress report for 1923. London, 1923, p. 765-73)

Ortsbestimmungen. A. Terrestrische ortsbestimmung. B. Astronomische ortsbestimmung. C. Funkentelegraphische ortsbestimmung, von A. Wedemeyer und O. Nairz. (In Mödebecks taschenbuch für flugtechniker und luftschiffer. Berlin, 1923, p. 308-63. diagrs., illus.)

Radio direction finding in flying machines. Scientific american, New York, Dec. 1922, v. 127, p. 409. (Also Nature, London, July 8, 1922, v. 110, no. 2749, p. 59)

La Radiogoniométrie, par M. Mesny. Annales des postes, télégraphes et téléphones, Paris, Nov.-Dec. 1922, v. 11, no. 6, p. 1240-63. illus.

Wireless position finding for aircraft. Aerial age weekly, New York, June 22, 1922, v. 15, p. 328. (Also Flight, London, May 25, 1922, v. 14, no. 21, p. 299)

Directional transmission of electro-magnetic waves for navigational purposes, by J. Erskine-Murray and James Robinson. Institution of electrical engineers journal, London, Mar. 1922, v. 60, p. 352-62.

Wireless navigation and nocturnal flight, by George F. Lees. Discovery, London, Mar. 1922, v. 3, no. 26, p. 73-76. illus.

Methods of air navigation - directional wireless, by Herbert V. Thaden. Aviation, New York, Feb. 27, 1922, v. 12, no. 9, p. 252-55. illus.

Direction and position finding by wireless. Paris, Wireless press, ltd., 1922. 376 p. illus.

## RADIO POSITION FINDING

The Radio direction finder and its application to navigation, by Frederick A. Kolster and Francis Winkley Dunmore. Washington, Govt. print. off., 1922. (U.S. Bureau of standards scientific papers no. 428)

Sur la solution du problème du guidage des mobiles aériens par brume ou de nuit sans aucune visibilité, par William Loth. C. R. Acad. sci., Paris, Dec. 5, 1921, v. 173, p. 1152.

Determination of position of aircraft by radio. Aviation, New York, July 11, 1921, v. 11, no. 2, p. 44. tables.

La Navigation aérienne par la radiogoniométrie. La Vie technique et industrielle, Paris, June 1921, v. 2, no. 21, p. 214-17. diagrs., illus.

Aeroplane direction finding. Aviation, New York, Feb. 7, 1921, v. 10, p. 179. (Also Aerial age, New York, Jan. 31, 1921, v. 12, no. 21, p. 545)

Position plotting by radio bearings, by Elmer B. Collins. U.S. Naval institute proceedings, Annapolis, Md., Feb. 1921, v. 47, no. 216, p. 201-05, map, tables.

Radio as applied to air navigation in the air-mail service, by James C. Edgerton. U.S. Air service, New York, Feb. 1921, v. 5, no. 1, p. 12-14. illus.

La Direction des avions par T.S.F., par Maurice Percheron. Paris, E. Leroux, 1921. 59 p. illus., plates.

Directive wireless telegraphy. Direction and position finding. The theory and practice of directive wireless transmission and reception as applied to the signalling and determination of direction and position on land, at sea, and in the air, by Louis H. Walter. New York, Sir Isaac Pitman and sons, 1921. 124 p. diagrs., illus., maps, tables.

Le Droit radiogoniométrique, par Ch. Bertin. Paris, Gauthier-Villars et cie., 1921. 12 p. diagrs.

Navigatie in vliegtuigen, door J.S.C. Olivier. Marineblad, Helder, 1921, v. 36, p. 324-49. diagrs., tables.

An Electrical signalling method for guiding aerial and marine craft, by Robert H. Marriott. Proceedings of the Institute of radio engineers, New York, Oct. 1920, v. 8, no. 5, p. 345-57. illus.

Direction and position finding. The Bellini-Tosi system. Aeronautics, London, Apr. 1, 1920, v. 18, no. 337, p. 283.

AIR NAVIGATION

Direction and position finding, by H. J. Round. Journal of the Institution of electrical engineers, London, Mar. 1920, v. 58, no. 289, p. 224-57. illus. (Also Engineering, London, Jan. 23-30, 1920, v. 109, p. 108-12, 161-69)

A Method of direction finding of wireless waves and its application to aerial and marine navigation, by James Robinson. Radio review, London, Feb.-Mar. 1920, v. 1, no. 5-6, p. 213-19, 265-75. diagrs., tables.

The Prospective utilization of vessel to-shore radio-compass bearings in aerial and transoceanic navigation, by G. W. Littlehales. American society of naval engineers journal, Washington, Feb. 1920, v. 32, no. 1, p. 38-44. illus.

La Goniométrie radio-électrique dans la navigation aérienne, par H. Marchand. L'Industrie électrique, Paris, Jan. 10, 1920, v. 29, p. 4.

How airplanes are navigated by wireless, by Ronald H. Keen. Wireless world, London, Oct. 1919, Jan. 1920, v. 7, no. 79, 82, p. 389-93; 578-82.

La Radiogoniométrie et la navigation aérienne. La Vie aérienne, Paris, 1920, p. 1174-80, 1188. illus.

Directional wireless in air navigation, by James Robinson. Automotive industries, New York, Nov. 13, 1919, v. 41, p. 958.

Wireless navigation for aircraft, by James Robinson. Electrician, London, Oct. 10, 1919, v. 83, p. 420. (Also Aeronautics, New York, Sep. 25, 1919, v. 17, p. 301 and Nature, London, Sep. 11, 1919, v. 104, p. 24)

Wireless telegraphy applied to aviation, by W. Knight. Aviation, New York, July 1, 1919, v. 6, no. 11, p. 572-75. diagrs.

Finding aircraft landing stations by means of frequency receivers, by Earl C. Hanson. Flying, New York, June 1919, v. 8, no. 5, p. 442-43. illus.

GENERAL

Composite report of transport pilot questionnaire sent out by air navigation division. Air commerce bulletin, Washington, Mar. 15, 1936, v. 7, no. 9, p. 220-30.

## GENERAL

And now enters the avigator, by Philip V. H. Weems. Popular aviation, Chicago, June 1934, v. 14, no. 6, p. 376, 395.

Navigation in ground schools, by Leslie S Potter. Aero digest, New York, May 1931, v. 18, no. 5, p. 56, 130, 132. illus.

Avigation. Some non-technical observations on the present status and trend of development of avigation, by Albert F. Hegenberger. Journal of the Maryland academy of sciences, Baltimore, Oct. 1930, v. 1, no. 4, p. 212-22.

The Development of air navigation. Notes on the evolution of instruments and other aids and their application in practise, by C. R. McMullin. Aircraft engineering, London, Sep. 1930, v. 2, no. 19, p. 232-33. illus.

Air navigation facilities, by F. C. Hingsburg. Aviation, New York, Aug. 1930, v. 29, no. 2, p. 69-74. illus., maps.

Navigation on the non-stop flight from New York to Bermuda and return, by H. P. McLean Connor. Aero digest, New York, Aug. 1930, v. 17, no. 2, p. 40-43, 182, 186. illus.

Flying the air route to Cuba, by William C. Hammond. Aero digest, New York, Feb. 1930, v. 16, no. 2, p. 70-71, 246. illus.

Training for the use of compass and map, by Y. Rozenberg. Vestnik vozdushnovo flota, Moscow, 1930, no. 8, p. 9-10. diagrs.

Stock taking of air-navigation aids. Air commerce bulletin, Washington, Sep. 2, 1929, v. 1, no. 5, p. 6-7.

Les Méthodes et les instruments de navigation aérienne. Le Génie civil, Paris, June 16, 1928, v. 92, no. 24, p. 591-92.

Avigation equipment, by Philip V. H. Weems. Aero digest, New York, June 1928, v. 12, no. 6, p. 926-27. illus.

Avigation, by Albert F. Hegenberger. Tech engineering news, Cambridge, Mass., May 1928, v. 9, no. 4, p. 140-42, 162, 164. illus.

Avigation, by Richard E. Byrd. Slipstream, Dayton, Ohio, Dec. 1927, v. 8, no. 12, p. 7-8, 35. illus.

Aerial navigation, by Bradley Jones. S.A.E. journal, New York, Aug. 1926, v. 19, no. 2, p. 162-64.

## AIR NAVIGATION

La Consécration d'une méthode de navigation. De Paris à Gao avec la mission de Goys, par Yves Le Prieur. C. R. Acad. sci., Paris, Apr. 20, 1925, v. 180, no. 16, p. 1193-94.

Air navigation training of the summer staff of the air fleet, by S. Nozdrovski. Vestnik vozdushnovo flota, Moscow, 1925, no. 4, p. 18-20.

Basic observations on the practice of avio-navigation service, by P. A. Molchanov. Vestnik vozdushnovo flota, Moscow, 1925, no. 5-6, p. 50-62. illus., tables.

Air navigation. The most important of the unsolved problems relating to aviation, by H. E. Wimperis. Aeronautical journal, London, Aug. 1919, v. 23, no. 104, p. 445-61. illus. (Also Aeronautics, London, May 8, 1919, v. 16, no. 290, p. 482-87 and Flight, London, May 8, 1919, v. 11, no. 19, p. 600-04)

## Section III

## BOOKS AND PAMPHLETS ON FLIGHT INSTRUMENTS

Behavior of static pressure heads at high speeds, by Helmut Danielzig. Washington, 1938. 12 p. diagrs., illus. (N.A.C.A. Technical memorandums no. 865) (From Luftfahrtforschung, Berlin, June 20, 1937, v. 14, no. 5, p. 304-09)

Earth's magnetism and compasses, by C. W. Martin. (In his Martin's air navigation. London, The Eversley press, ltd., 1938. p. 73-143)

Gyroscopic instruments for instrument flying, by William G. Brombacher and W. C. Trent. Washington, 1938. 37 p. diagrs., illus., tables. (N.A.C.A. Technical notes no. 662)

N.A.C.A. stall-warning indicator, by F. L. Thompson. Washington, 1938. 8 p. charts, diagrs., illus. (N.A.C.A. Technical notes no. 670)

Rate-of-climb recorder, by Helmut Danielzig. Washington, 1938. 10 p. diagrs., illus. (N.A.C.A. Technical memorandums no. 849) (From Luftwissen, Berlin, May 1937, v. 4, no. 5, p. 153-57)

Magnetism, compasses and aircraft instruments, by D. C. T. Bennett. (In his The Complete air navigator. London, Sir Isaac Pitman and sons, ltd., 1937. ch. 3, p. 80-128. diagrs., tables)

The Measurement of air speed of airplanes, by F. L. Thompson. Washington, 1937. 16 p. diagrs., plates. (N.A.C.A. Technical notes no. 616)

Note on the standardization of Pitot-static head position on monoplanes, by S. B. Gates and J. Cohen. London, H. M. Stat. off., 1937. 11 p. diagrs. (A.R.C. R. & M. no. 1778)

Performance characteristics of Venturi tubes used in aircraft for operating air-driven gyroscopic instruments, by Harcourt Sontag and Daniel P. Johnson. Washington, 1937. 19 p. diagrs., illus., tables. (N.A.C.A. Technical notes no. 624)

Pressure drop in tubing in aircraft instrument installations, by W. A. Wildhack. Washington, 1937. (N.A.C.A. Technical notes no. 593)

Sonic altimeter for aircraft, by C. S. Draper. Washington, 1937. 98 p. diagrs., illus., plates. (N.A.C.A. Technical notes no. 611)

## FLIGHT INSTRUMENTS

Aircraft compass characteristics, by John B. Peterson and Clyde W. Smith. Washington, U.S. Govt. print. off., 1936. 11 p. diagrs., tables. (N.A.C.A. Report no. 551)

Calibration of standard Pitot-static heads in high-speed tunnel, by C.N.H. Lock and W.F. Hilton. London, H.M. Stat. off., 1936. 3 p. (A.R.C. R. & M. no. 1752)

Les Compas d'aviation. Cours élémentaire de compensation et d'emploi à l'usage des candidats chefs de bord de l'armée de l'air et des candidats aux divers brevets de navigation aérienne, par Robert Gaujour. Paris, Lavauzelle, 1936. 172 p. diagrs., illus., maps.

Experiments on the use of a static tube in the wing wake and a short Pitot tube in the leading edge as an airspeed indicator. London, H.M. Stat. off., 1936. 6 p. illus., table. (A.R.C. R. & M. no. 1779)

Full-scale wind-tunnel tests to determine a satisfactory location for a service Pitot-static tube on a low wing monoplane, by John F. Parsons. Washington, 1936. (N.A.C.A. Technical notes no. 561)

Sperry gyro-compass. Great Britain. Admiralty. London, H.M. Stat. off., 1936. (Manual of 1931, Addenda no. 1, June 1936)

Aircraft compasses. Great Britain. Air ministry. (In Manual of air navigation. London, H.M. Stat. off., 1935. p. 153-70. diagrs., illus.) (Air publication no. 1234)

Altitude instruments. Altitude indicators, by James Ross Allen. (In his Airplane instruments; theory of flight. Scranton, Pa., International text book company, 1935. p. 9-34. diagrs., illus.)

Comparative tests of Pitot-static tubes, by Kenneth G. Merriam and Ellis R. Spaulding. Washington, 1935. 37 p. diagrs., illus. (N.A.C.A. Technical notes no. 546)

Compass errors and compensation, by Frank Wilbur Wead and James Ross Allen. (In their Practical flying and meteorology. Scranton, Pa., International text book company, 1935. p. 19-50. diagrs., illus., maps)

The Kruesi radio compass. Woodside, New York, Fairchild aerial camera corporation, 1935. 14 p. diagrs.

## BOOKS AND PAMPHLETS

Magnetic phenomena. Compass errors, by Frank Wilbur Wead and James Ross Allen. (In their Practical flying and meteorology. Scranton, Pa., International text book company, 1935. p. 19-46. diagrs., map)

Navigational instruments. Great Britain. Air ministry. (In Manual of air navigation. London, H. M. Stat. off., 1935. p. 113-35. diagrs., illus., tables) (Air publication no. 1234)

Practical compass adjustment. Great Britain. Air ministry. (In Manual of air navigation. London, H. M. Stat. off., 1935. p. 179-96. diagrs., tables) (Air publication no. 1234)

Instruments; repair, overhaul, testing, and calibration of aircraft and aero-engine instruments; adjustment; installation and compensation of compasses in aircraft, by R. W. Sloley. London, Sir Isaac Pitman and sons, ltd., 1934. 81 p. diagrs., illus.

Measurement of altitude in blind flying, by William G. Brombacher. Washington, 1934. 34 p. (N.A.C.A. Technical notes no. 503)

The Cause and elimination of night effects in radio range-beacon reception, by Harry Diamond. Washington, U.S. Govt. print. off., 1933. 28 p. diagrs., illus., tables. (From Bureau of standards journal of research, Washington, 1933, v. 10, no. 1, p. 7-34)

A Speedometer which indicates true airspeed, by Tatudiro Sasaki and Tokurô Yosida. Tokyo, Tokyo imperial university, 1933. 22 p. (Aeronautical research institute report no. 95) (Abstract L'Aerotecnica, Roma, July 1933, v. 13, no. 7, p. 960)

Aircraft speed instruments, by Karl Hilding Beij. Washington, U.S. Govt. print. off., 1932. 54 p. (N.A.C.A. Report no. 420) (Abstract L'Aerotecnica, Roma, June 1933, v. 13, no. 6, p. 795)

Stabilisateur automatique pour aéroplanes à actionnement pneumatique, par L. Marmonier. Lyon, Imprimerie Gautier et Laforet, 1932. 35 p. illus.

Aircraft instruments, by Oliver Stewart. (In his Cross country flying. London, Constable and company, ltd., 1931. p. 34-55. diagrs., illus.)

The Compass, by Frank Arthur Swoffer. (In his Air navigation for the private owner. London, Sir Isaac Pitman and sons, ltd., 1931. p. 41-62. charts, diagrs., illus.)

FLIGHT INSTRUMENTS

The Compass, by Oliver Stewart. (In his Cross country flying. London, Constable and company, ltd., 1931. p. 23-33. diagrs., illus.)

Effect of viscosity in speed measurements with double-throat Venturi tubes, by H.Peters. Washington, 1931. 5 p. diagrs. (N.A.C.A. Technical memorandums no. 633) (From Z.F.M., Berlin, June 15, 1931, v. 22, no. 11, p. 321-23)

Elementary magnetism. Calculating deviation, compass-swinging, swinging bases, by Leslie S. Potter. (In his The Navigation of the air and meteorology. New York; London, Harper and brothers, 1931. p. 154-76. diagrs., illus., tables)

Instruments, by Leslie S. Potter. (In his The Navigation of the air and meteorology. New York; London, Harper and brothers, 1931. p. 51-75. diagrs., illus., tables)

Investigation of damping liquids for aircraft instruments, Part I-II, by M. R. Houseman and G. H. Keulegan. Washington, U.S. Govt. print. off., 1929, 1931. 33 p. diagrs., illus., tables. (N.A.C.A. Reports no. 299, 398)

Magnetism and the compass, by Bradley Jones. (In his Avigation. New York, John Wiley and sons, 1931. p. 6-30. charts, diagrs., illus., tables)

Miscellaneous instruments, by Bradley Jones. (In his Avigation. New York, John Wiley and sons, 1931. p. 31-42. diagrs.)

Present status of aircraft instruments. Report prepared by the Subcommittee on instruments. Washington, U. S. Govt. print. off., 1931. 26 p. (N.A.C.A. Report no. 371)

Variation and deviation of magnetic type compasses, by Harvey Hodges Holland. (In his Avigation. New York; London, McGraw-Hill book company, inc., 1931. p. 72-95. diagrs., illus., maps, tables)

Aircraft instruments, by Charles John Stewart. London, Chapman and Hall; New York, John Wiley and sons, 1930. 269 p. diagrs., illus., plates.

The Behm acoustic sounder for airplanes with reference to its accuracy, by Ernest Schreiber. Washington, 1930. 18 p. diagrs., illus., tables. (N.A.C.A. Technical memorandums no. 588)

Equipment used in experiments to solve the problem of fog flying. New York, Daniel Guggenheim fund for the promotion of aeronautics, inc., 1930. 57 p. diagrs., illus.

## BOOKS AND PAMPHLETS

Kelvin, Bottomley and Baird, ltd., pioneers in design and construction of aircraft compasses. (In Air annual of the British Empire. London, 1930. p. 628-35. illus.)

Gli strumenti aeronautici di bordo, di navigazione, di controllo del motore, di U. Ciamberlini. Milano, U. Hoepli, 1930. 208 p. tables.

The Compass, by Logan C. Ramsey. (In his The Navigation of aircraft. New York, The Ronald press company, 1929. p. 29-54. diagrs., illus.)

Compass errors and compensation, by Lewis Alonzo Yancey. (In his Aerial navigation and meteorology. New York, The Norman W. Henley publishing company, 1929. p. 45-100. charts, diagrs., maps, tables)

Pressure element of constant logarithmic stiffness for temperature compensated altimeter, by William G. Brombacher and F. Cordero. Washington, U.S. Govt. print. off., 1929. 13 p. diagrs. (N.A.C.A. Report no. 310)

The Theory of the gyroscopic compass and its deviations, by A. L. Rawlings. London, MacMillan and company, 1929. 191 p. diagrs., illus.

Height of airplane above ground by radio echo, by E. F. W. Alexanderson. (In International civil aeronautics conference. Washington, U.S. Govt. print. off., 1928. p. 613-18)

Die Höhenmessung in der luftnavigation, von H. Koppe. (In Arbeiten zur luftnavigierung. München und Berlin, R. Oldenbourg, 1927. p. 41-63. illus.)

The Installation and correction of compasses in airplanes, by M. F. Schoeffel. Washington, 1927. 17 p. diagrs., tables. (N.A.C.A. Technical notes no. 262)

Neigungsmesser und wendezeiger für flugzeuge, von E. Everling. (In Arbeiten zur luftnavigierung. München und Berlin, R. Oldenbourg, 1927. p. 9-31. diagrs., illus.)

Aircraft instruments, by Herbert N. Eaton, K. Hilding Beij and William G. Brombacher. New York, The Ronald press company, 1926. 269 p. diagrs., illus., plates.

Behm acoustic sounder for aircraft. Washington, 1926. 5 p. illus. (N.A.C.A. Technical memorandums no. 346) (From Flugsport, Berlin, Nov. 11, 1925)

N.A.C.A. flight-path-angle and air speed recorder, by Donald G. Coleman. Washington, 1926. 11 p. illus. (N.A.C.A. Technical notes no. 233)

## FLIGHT INSTRUMENTS

Note on a hot-wire speed and direction meter, by L. F. G. Simmons and A. Bailey. London, H. M. Stat. off., 1926. 7 p. diagrs., plates. (A.R.C. R. & M. no. 1019)

Performance of air speed tubes exposed to rain drops and freezing rain, by J. E. Eshbaugh. Washington, U.S. Govt. print. off., 1926. diagrs., illus., tables. (U.S. Air service information circular no. 549)

Tables for calibrating altimeters and computing altitudes based on the standard atmosphere, by William G. Brombacher. Washington, U.S. Govt. print. off., 1926. 24 p. (N.A.C.A. Report no. 246)

Das Behmlot und seine entwicklung als akustischer höhenmesser für luftfahrzeuge, von A. Behm. München, Druck von R. Oldenbourg, 1925. 22 p. illus.

The Design of Pitot-static tubes, by E. Ower and F. C. Johansen. London, H. M. Stat. off., 1925. 10 p. diagrs., plates. (A.R.C. R. & M. no. 981)

Interference tests on N.A.C.A. Pitot tube, by Elliot G. Reid. Washington, U.S. Govt. print. off., 1925. 8 p. illus. (N.A.C.A. Report no. 199)

Non-metallic diaphragms for instruments, by Herbert N. Eaton and C. T. Buckingham. Washington, U.S. Govt. print. off., 1925. 24 p. illus. (N.A.C.A. Report no. 206)

Pitot-static tubes for determining the velocity of air, by H. Kumbruch. Washington, 1925. 51 p. illus. (N.A.C.A. Technical memorandums no. 303) (From Forschungsarbeiten auf dem gebiete des ingenieurwesens, Berlin, 1921, no. 240)

Aeronautic instruments, by E. Everling and H. Koppe. Washington, 1924. 14 p. (N.A.C.A. Technical memorandums no. 249) (From Zeitschrift des V.D.I., Berlin, Apr. 1, 1922, v. 66, no. 13)

Air navigation instruments (excluding compasses). Great Britain. Air ministry. London, H. M. Stat. off., 1924. 28 p. diagrs., illus. (Air publication no. 803)

Methods and instruments in contemporary avio-navigation service, by P. A. Molchanov. Leningrad, 1924. 198 p. diagrs., illus., tables.

Aeronautic instruments, by Franklin L. Hunt. Washington, U.S. Govt. print. off., 1923. (U.S. Bureau of standards technologic papers no. 237)

Aeronautical instruments, by Kurt Bennewitz. Washington, 1923. 13 p. illus. (N.A.C.A. Technical notes no. 145) (From Technische berichte, Charlottenburg, 1918, v. 3, no. 5)

## BOOKS AND PAMPHLETS

The De Bothezat barograph; type A, by W. F. Gerhardt. Washington, U.S. Govt. print. off., 1923. 11 p. illus. (U.S. Air information circular no. 439)

Diaphragms for aeronautic instruments, by M. D. Hersey. Washington, U.S. Govt. print. off., 1923. 32 p. illus. (N.A.C.A. Report no. 165)

Directive radio transmission on a wave length of 10 meters, by Francis W. Dunmore and F. H. Engel. Washington, U.S. Govt. print. off., 1923. 16 p. (Bureau of standards scientific papers no. 469)

Navigational equipment for long distance flights, by H. E. Wimperis. (In International air congress report for 1923. London, 1923, p. 756-65. diagrs., illus., maps)

Tests on improved models of aircraft compasses. London, H. M. Stat. off., 1923. 4 p. diagrs. (A.R.C. R. & M. no. 868)

Aerial navigation and navigating instruments, by Herbert N. Eaton. Washington, U.S. Govt. print. off., 1922. 44 p. diagrs., illus. (N.A.C.A. Report no. 131)

Aeronautic instruments - recent developments and outstanding problems, by Franklin L. Hunt. Washington, U.S. Govt. print. off., 1922. 14 p. (N.A.C.A. Report no. 132)

The Altitude effect on air speed indicators, by Herbert N. Eaton, Walter A. MacNair, Mayo D. Hersey and Franklin L. Hunt. Washington, U. S. Govt. print. off., 1921-1922. diagrs., illus., tables. (N.A.C.A. Reports no. 110, 156)

Directional instruments. Turn indicators, by R. C. Sylvander and E. W. Rounds. Washington, U. S. Govt. print. off., 1922. (N.A.C.A. Report no. 128)

Entfernungs- und höhenmessung in der luftfahrt, von Walther Meissner. Braunschweig, F. Vieweg und sohn, 1922. 92 p. diagrs., illus.

Flugzeuginstrumente, von Kurt Bennewitz. Berlin, R. C. Schmidt und co., 1922. 324 p. diagrs., illus., tables.

The Magnetic compass in aircraft. Great Britain. Air ministry. London, H. M. Stat. off., 1922. 23 p. illus., plates. (Air publication no. 802)

Le Compas de navigation aérienne, par J. Rouch. Paris, Masson et cie., 1921. 72 p. charts, diagr., tables.

## FLIGHT INSTRUMENTS

General instrument and oxygen equipment. London, H. M. Stat. off., 1921. 121 p. charts, diagrs., illus. (Air publication no. 388)

The Northerly turning error of compasses in aircraft, by A. P. Rowe. London, H.M. Stat. off., 1921. 7 p. diagrs., illus. (A.R.C. R. & M. no. 875)

Some characteristics of aircraft compasses, by H. E. Wimperis and A. P. Rowe. London, H.M. Stat. off., 1921. 5 p. diagrs. (A.R.C. R. & M. no. 735)

Barometry and aeronautic instruments. (In Washington, U.S. Bureau of standards annual reports, 1911 - p. 12; 1912 - p. 13-14; 1913 - p. 8; 1914 - p. 19; 1915 - p. 20-21; 1916 - p. 21; 1917 - p. 27-28; 1918 - p. 125-27; 1919 - p. 174-81; 1920 - p. 167-73)

Comparison of United States and British standard Pitot static tubes, by A. F. Zahm and R. H. Smith. Washington, U.S. Govt. print. off., 1920. 8 p. illus. (N.A.C.A. Report no. 81)

Preliminary report on the forced oscillations of aircraft compasses, by R. S. Capon and A. Lee. London, H. M. Stat. off., 1920. 9 p. diagrs., plates. (A.R.C. R. & M. no. 874)

Rate-of-climb indicator. Washington, U. S. Govt. print. off., 1920. 3 p. illus. (U.S. Air service information circular no. 31)

Repair and calibration of airplane instruments. U.S. Air service. War department. Washington, U.S. Govt. print. off., 1920. 19 p. diagrs., illus. (War department document no. 925)

Aeronautical instruments, by Arthur William Judge. (In his Handbook of modern aeronautics. New York, D. Appleton Company, 1919. p. 680-710. diagrs., illus., tables.)

Air speed meters for aerial navigation. U.S. Office of chief of air corps. War department. Washington, U.S. Govt. print. off., 1919. 12 p. diagrs., plates. (War department document no. 918)

Compasses for aerial navigation. U.S. Air service. War department. Washington, U.S. Govt. print. off., 1919. 18 p. diagrs., illus. (War department document no. 921)

Inclinometers for aerial navigation. U.S. Air service. War department. Washington, U.S. Govt. print. off., 1919. 6 p. illus. (War department document no. 920)

Special inclinometers and turn indicators for aerial navigation. U.S. Air service. War department. Washington, U.S. Govt. print. off., 1919. 8 p. illus. (War department document no. 922)

The Design of a sensitive yawmeter, by J. R. Pannell and R. Jones. London, H.M. Stat. off., 1918. 8 p. diagrs., tables. (A.R.C. R. & M. no. 445)

Flugzeugkompasswesen und flugsteuerkunde, von Werner Immler. Berlin-Charlottenburg, C. J. E. Volckmann nachf. g.m.b.h., 1918. 141 p. diagrs., illus., tables.

Instruction for installing and testing a compass on an aeroplane, by N. Kalitin. Petrograd, 1918. 44 p. diagrs.

Aeroplane instruments as manufactured by Taylor instrument companies. Rochester, New York, 1917. 10 p. illus.

Instruments. London, H.M. Stat. off., 1916 - 1917. tables. (A.R.C. R. & M. no. 295)

Navigation, magnetism and deviation of the compass. Great Britain. Air ministry. London, H.M. Stat. off., 1917. (Air publication no. 256)

Note on a rate-of-climb indicator for use on aeroplanes. London, H.M. Stat. off., 1917. 4 p. diagrs., table. (A.R.C. R. & M. no. 310)

Turn indicators for aeroplanes, by F.A. Lindemann. London, H.M. Stat. off., 1917. 8 p. diagrs., tables. (A.R.C. R. & M. no. 525)

Compass deviation in aircraft. London, H.M. Stat. off., 1915-1916. 43 p. diagrs., illus., tables. (A.R.C. R. & M. no. 238)

General specifications for aeronautic instruments. Washington, U.S. Govt. print. off., 1916. 6 p. (N.A.C.A. Report no. 8) (Abstract Aviation and aeronautical engineering, New York, Aug. 15, 1916, v. 1, no. 2, p. 15-16)

The Pitot tube and other anemometers for aeroplanes, by W.H. Herschel. (In Investigation of Pitot-tubes, Part I. Washington, U.S. Govt. print. off., 1915. 23 p. diagrs., tables. (N.A.C.A. Report no. 2)

The Theory of the Pitot and Venturi tubes, by E. Buckingham. (In Investigation of Pitot tubes, Part II. Washington, U.S. Govt. print. off., 1915. 10 p. tables. (N.A.C.A. Report no. 2)

## Section IV

## PERIODICAL ARTICLES, BOOKS, PAMPHLETS, ETC., ON FLIGHT INSTRUMENTS, CLASSIFIED BY SUBJECT.

### FLIGHT INSTRUMENTS - AIRSPEED INDICATOR

Principle and tests of the mirror type Pitot, by Alexander Klemin. Journal of the aeronautical sciences, New York, June 1938, v. 5, no. 8, p. 321-24. diagrs., illus.

Behavior of static pressure heads at high speeds, by Helmut Danielzig. Washington, 1938. 12 p. diagrs., illus. (N.A.C.A. Technical memorandums no. 865) (From Luftfahrtforschung, Berlin, June 20, 1937, v. 14, no. 5, p. 304-09)

Pitot overcoats. Aviation, New York, Aug. 1937, v. 36, p. 54.

Measurement of speeds. Errors inherent on the standard installation and methods for determining true air speed accurately, by A.E.W. Nutt. Aircraft engineering, London, Apr. 1937, v. 9, no. 98, p. 91-96. diagrs., illus.

Aeronautical and navigational instruments, by G. W. H. Gardner. Journal of scientific instruments, London, Feb. 1937, v. 14, no. 2, p. 52-56. illus.

The Measurement of air speed of airplanes, by F. L. Thompson, Washington, 1937. 16 p. diagrs., illus. (N.A.C.A. Technical notes no. 616) (Also Journal of the aeronautical sciences, New York, Aug. 1937, v. 4, no. 10, p. 423-26)

Note on the standardization of Pitot-static head position on monoplanes, by S.B. Gates and J. Cohen. London, H.M. Stat. off., 1937. 14 p. diagrs. (A.R.C. R. & M. no. 1778)

A German weatherproof Pitot head. Flight, London, Sep. 10, 1936, v. 30, no. 1446, p. 273. illus.

Research on Venturi-type air speed meter, by M. Itaya. Journal of the Society of naval architects of Japan, Tokyo, June 1936, v. 58, p. 201-05.

Nota sugli indicatori di velocità per aeroplani, di Febo Rege-Gianas. Rivista aeronautica, Roma, Apr. 1936, v. 12, no. 4, p. 15-22. illus.

The Effect of tubing on the indications of an airspeed meter, by W.R. Weems. Journal of the aeronautical sciences, New York, Mar. 1936, v. 3, no. 5, p. 165-67.

Calibration of standard Pitot-static heads in high-speed tunnel, by C.N.H. Lock and W.F. Hilton. London, H. M. Stat. off., 1936. 3 p. (A.R.C. R. & M. no. 1752)

## FLIGHT INSTRUMENTS

Experiments on the use of a static tube in the wing wake and a short Pitot tube in the leading edge as an airspeed indicator. London, H. M. Stat. off., 1936. 6 p. illus., table. (A.R.C. R. & M. no. 1779)

Full-scale wind-tunnel tests to determine a satisfactory location for a service Pitot-static tube on a low-wing monoplane, by John F. Parsons. Washington, 1936. (N.A.C.A. Technical notes no. 561)

Der Einfluss von schwingungen des staurohrs oder von geschwindigkeitsschwankungen auf die staudruckanzeige, von G. Kiel. Z.A.M.M., Berlin, Oct. 1935, v. 15, no. 5, p. 290-300. diagrs., illus.

Ricerche sperimentali sul ricupero di pressione in un tubo di Venturi con interposto tratto cilindrico, di P. Aymerito. Ricerche d'ingegneria, Roma, June 3, 1935, no. 1, p. 16-22. diagrs., illus.

Boyle velometer. Air speed indicator. Aero digest, New York, June 1935, v. 26, no. 6, p. 50. illus.

Air speedometers, by James Ross Allen. (_In his_ Airplane instruments; theory of flight. Scranton, Pa., International text-book company, 1935. p. 35-48. diagrs., illus.)

Comparative tests of Pitot-static tubes, by Kenneth G. Merriam and Ellis R. Spaulding. Washington, 1935. 37 p. diagrs., illus. (N.A.C.A. Technical notes no. 546) (_Also_ Journal of the aeronautical sciences, New York, Nov. 1935, v. 3, no. 2, p. 55)

Improving air speed accuracy by Pitot tube location, by G. Tate, Jr. Aviation, New York, Nov. 1933, v. 32, no. 11, p. 339.

A Speedometer which indicates true airspeed, by Tatudirô Sasaki and Tokurô Yosida. Tokyo, Tokyo imperial university, 1933. (Aeronautical research institute report no. 95) (_Abstract_ L'Aerotecnica, Roma, July 1933, v. 13, no. 7, p. 960)

Correcting your air speed indicator, by L. D. Webb. U.S. Air services, Washington, May 1932, v. 17, no. 5, p. 27-28. diagr.

Flight instruments, by Charles H. Colvin. U.S. Air services, Washington, Mar. 1932, v. 17, no. 3, p. 29-32. illus.

Air speed indicators and blind flying, by V. C. Finch. Aviation, New York, June 1931, v. 2, no. 10, p. 8-10. illus.

# AIRSPEED INDICATOR

Sur les conditions de fonctionnement du tube de Pitot. Note de L. Escande et M. Teissié Solier. C.R. Acad. sci., Paris, May 11, 1931, v. 192, no. 19, p. 1152-54. diagrs.

The Pilot and his air speed meter, by Logan C. Ramsey. Aero digest, New York, Feb. 1931, v. 18, no. 2, p. 48-49, 146. diagrs., illus.

Checking upon speed indicators by the rectangular method, by M. A. Teitz. Tekhnika vozdushnovo flota, Moscow, 1931, no. 7, p. 451-56. diagrs., illus.

Effect of viscosity in speed measurements with double-throat Venturi tubes, by H. Peters. Washington, 1931. 5 p. diagrs. (N.A.C.A. Technical memorandums no. 633) (From Z.F.M., Berlin, June 15, 1931)

Erreurs d'indication fournies par l'indicateur de vitesse et provenant d'un montage défectueux du Venturi sur l'avion. Aéro revue Suisse, Berne, May 1930, v. 5, no. 5, p. 131-33. diagrs.

Über den gültigkeitsbereich der staudruckmessungen mit staudruckmultiplikatoren. Bruhnsche Venturi-Doppelduese, von H. Peters. Z.F.M., Berlin, Feb. 28, 1929, v. 20, no. 4, p. 90-92. diagrs.

Consolidated air-speed indicator. Aviation, New York, July 28, 1928, v. 25, p. 340. illus.

Pioneer air speed indicator. Aviation, New York, July 21, 1928, v. 25, p. 280. illus.

Indicateur de vitesse limite Barros. La Nature, Paris, June 1, 1928, no. 2786, p. 519.

Modern development in aircraft instruments, by C. J. Stewart. Journal of the R.A.S., London, June 1928, v. 32, no. 210, p. 425-81. illus.

Airplane instruments. Popular aviation, Chicago, Dec. 1927, v. 1, no. 5, p. 43-44, 64. illus.

L'Appareil de chronométrage automatique Dumanois Ceccaldi. L'Aérophile, Paris, Oct. 1-15, 1927, v. 35, no. 19-20, p. 311-13. illus.

Paris flight shows need for speed indicator. Popular mechanics, Chicago, Aug. 1927, v. 48, p. 183-85. illus., map.

Notes on air speed indicators. Aviation, New York, Dec. 13, 1926, v. 21, no. 24, p. 1001-02. illus.

## FLIGHT INSTRUMENTS

N.A.C.A. flight-path-angle and air speed recorder, by Donald G. Coleman. Washington, 1926. 11 p. illus. (N.A.C.A. Technical notes no. 233)

Note on a hot-wire speed and direction meter, by L. F. G. Simmons and A. Bailey. London, H. M. Stat. off., 1926. 7 p. diagrs., illus., plates. (A.R.C. R. & M. no. 1019)

Performance of air speed tubes exposed to rain drops and freezing rain, by J. E. Eshbaugh. Washington, U. S. Govt. print. off., 1926. diagrs., illus., tables. (U.S. Air service information circular no. 549)

L'Estimographe Brion. L'Aéronautique, Paris, Aug. 1925, v. 7, no. 75, p. 302. illus.

Indicateur acoustique de vitesse relative pour aéronef, par A de Gramont de Guiche. L'Aérophile, Paris, Mar. 1-15, 1925, v. 33, no. 5-6, p. 76. illus. (Also Le Génie civil, Paris, Jan. 17, 1925, v. 86, p. 67-68 and C. R. Acad. sci., Paris, Dec. 29, 1924, v. 179, no. 26, p. 1591-93)

The Design of Pitot-static tubes, by E. Ower and F. C. Johansen. London, H. M. Stat. off., 1925. 10 p. diagrs., plates. (A.R.C. R. & M. no. 981)

Interference tests on an N.A.C.A. Pitot tube, by E. G. Reid. Washington, U.S. Govt. print. off., 1925. 8 p. illus. (N.A.C.A. Report no. 199)

Pitot-static tubes for determining the velocity of air, by H. Kumbruch. Washington, 1925. 51 p. illus. (N.A.C.A. Technical memorandums no. 303) (From Forschungsarbeiten auf dem gebiete des ingenieurwesens, Berlin, 1921, no. 240)

Aerial navigation instruments, by G. P. Luckey. U.S, Air service, Washington, Jan. 1924, v. 9, no. 1, p. 35-38.

Measurement of air speed in aeroplanes, by C. J. Stewart. Journal of scientific instruments, London, Nov. 1923, v. 1, no. 2, p. 43-50. illus.

New N.A.C.A. air speed meter. Aerial age, New York, July 1923, v. 16, no. 7, p. 323. diagrs., illus.

The Instrument equipment of aeroplanes, by Charles B. Clapham. Journal and record of transactions of the Junior institution of engineers, London, Apr. 13, 1923, v. 33, p. 311-56. diagrs., illus.

Navigational equipment for long-distance flights, by H. E. Wimperis. (In International air congress report for 1923. London, 1923, p. 756-65. diagrs., illus., maps)

## AIRSPEED INDICATOR

250 m.p.h. airspeed indicator. Aviation, New York, Dec. 18, 1922, v. 13, p. 809.

The Dugit altimeter and air speed indicator, by J. H. Blakely. Aviation, New York, Mar. 27, 1922, v. 12, no. 13, p. 371-72. illus.

Practical hints on aircraft instruments, by A. W. Hulbert. Aeroplane, London, Feb. 1, 1922, v. 22, no. 5, p. 88. illus.

The Altitude effect of air speed indicators. Parts I-II, by M. D. Hersey, F. L. Hunt, H. N. Eaton and W. A. McNair. Washington, U.S. Govt. print. off., 1921-1922. (N.A.C.A. Reports no. 110, 156)

N.A.C.A. recording air speed meter, by F. H. Norton. Washington, 1921. 3 p. illus. (N.A.C.A. Technical notes no. 64) (Also Aviation, New York, Nov. 28, 1921, v. 11, no. 22, p. 623 and Aerial age, New York, Oct. 24, 1921, v. 14, no. 7, p. 151-54)

Aeronautic instruments. General principles of construction, testing and use, by M. D. Hersey. Aviation, New York, July 1-15, 1920, v. 8, no. 11-12, p. 437-44, 473-76. illus. (Also Aerial age, New York, May 31-June 7, 1920, v. 11, p. 403-05, 437-38, 450; Mechanical engineering, New York, May 1920, v. 42, no. 5, p. 263-68 and Transactions of the A.S.M.E., New York, 1920, v. 42, p. 83-120)

Calibration of improved air speed indicator. S.A.E. journal, New York, June 1920, v. 6, no. 6, p. 442.

Pioneer aircraft instruments. Aerial age weekly, New York, May 3, 1920, v. 11, no. 8, p. 257-58. illus.

Comparison of United States and british standard Pitot static tubes, by A. F. Zahm and R. H. Smith. Washington, U.S. Govt. print. off., 1920. 8 p. illus. (N.A.C.A. Report no. 81)

Air speed indicators for dirigibles. Journal of the Franklin institute, Philadelphia, Oct. 1919, v. 188, p. 535-44. illus.

Calibration of air-speed meters. Aircraft journal, New York, June 21, 1919, v. 4, no. 25, p. 6.

Instrumente, von F. Schieferl. Österreichische flugzeitschrift, Wien, May 1919, v. 13, no. 5, p. 65-69. diagrs.

## FLIGHT INSTRUMENTS

Aeronautical instruments, by A. W. Judge. (In his Handbook of modern aeronautics. New York, D. Appleton company, 1919. p. 680-710. diagrs., illus., tables)

Air-speed meters for aerial navigation. U.S. Office of Chief of air corps. Washington, U.S. Govt. print. off., 1919. 12 p. diagrs., plates.

The Pilot's office. Instruments for air use, by William A. Robson. Scientific american supplement, New York, Nov. 2, 1918, v. 86, p. 285. (Also Flight, London, Aug. 15, 1918, v. 10, no. 33, p. 911)

Navigating instruments of our aerial pilots. Scientific american, New York, Aug. 17, 1918, v. 119, p. 141.

Experiments with Venturi tubes. Toussaint and Lepère tests to determine best form of design of instruments for airplane use. Bulletin of the Airplane engineering department, Dayton, Ohio, Aug. 1918, v. 1, no. 3, p. 67-77. diagr.

A German aircraft speed meter. Automotive industries, New York, July 4, 1918, v. 39, no. 1, p. 19.

Notes on speed indicators for aeroplanes - the Pitot tube, by W. H. Herschel. Aerial age, New York, Aug. 6, 1917, v. 5, no. 21, p. 720. illus. (Also Aeroplane, London, Apr. 14, 1917, v. 12, no. 14, p. 860-62)

Notes on speed indicators for aeroplanes - the Venturi tube by W. H. Herschel. Aviation and aeronautical engineering, New York, Feb. 15, 1917, v. 2, no. 2, p. 86-88.

Notes on speed indicators for airships, by W. H. Herschel. Aviation and aeronautical engineering, New York, Jan. 15, 1917, v. 1, no. 12, p. 384-85. illus.

Tests on air-speed meters, by S. J. Zeigler. Aviation and aeronautical engineering, New York, Nov. 15, 1916, v. 1, no. 8, p. 248-51. illus.

The Elliott air speed indicator. Aeronautics, New York, July 15, 1915, v. 17, no. 1, p. 12. illus.

Instruments used on airplanes; comments on their functions and defects. Scientific american supplement, New York, July 10, 1915, v. 80, no. 2062, p. 23.

Aeroplane speedometers, by O. A. Danielson. Aerial age, New York, June 21, 1915, v. 1, no. 14, p. 320.

The Pitot tube and other anemometers for airplanes, by W. H. Herschel. (In his Investigation of Pitot-tubes, Part I. Washington, U.S. Govt. print. off., 1915. 23 p. diagrs., tables. (N.A.C.A. Report no. 2)

## AIRSPEED INDICATOR

The Theory of the Pitot and Venturi tubes, by E. Buckingham. (In his Investigation of Pitot tubes, Part II. Washington, U.S. Govt. print. off., 1915. 10 p. tables. (N.A.C.A. Report no. 2)

An Aeroplane speedometer. Aeronautics, New York, July 31, 1914, v. 15, no. 2, p. 30. illus.

The Measurement of air speed, by Albert P. Thurston. Aeronautical journal, London, July 1914, v. 18, no. 71, p. 245-71. illus. (Also Flight, London, May 9-15, 1914, v. 6, no. 19-20, p. 498-99; 521-22)

Air-speed indicators. Aeronautical journal, London, Jan. 1914, v. 18, no. 69, p. 55. (Also Autocar, London, Mar. 8, 1913, v. 30, no. 907, p. 416)

The Theory of the gravity-controlled air speed indicator as applied to dynamic lift flying machines, by Harris Booth. Aeronautical journal, London, Jan. 1914, v. 18, no. 69, p. 56-58.

Scientific instruments; their design and use in aeronautics, by Horace Darwin. Scientific american supplement, New York, Aug. 2, 1913, v. 76, p. 66-67. (Also Journal of the Royal society of arts, London, July 14, 1913, v. 61, no. 3163, p. 793-803; Aero and hydro, Chicago, June 28, 1913, v. 6, no. 13, p. 251-56 and Engineering, London, May 23-30, 1913, v. 6, pt. 1-2, p. 720-22, 758)

The S.A.F. speedometer. Aeronautics, New York, Apr. 1913, v. 12, no. 4, p. 142. illus.

Pitot tube speed meter. Aeronautics, New York, Nov. 1912, v. 11, no. 5, p. 151. illus.

New air speedometer, by Frank E. Boland. Aeronautics, New York, Feb. 1912, v. 10, no. 2, p. 46. illus.

Étude sur le tarage au manège des anémomètres et des tubes de Pitot, par D. P. Riabouchinsky. Bulletin de l'Institut aérodynamique de Koutchino, Moscow, 1912, v. 4, p. 7-24. diagr., tables.

Elliott mechanism. Simplicity in speedometers. Flight, London, Dec. 11, 1909, v. 1, no. 50, p. 794. illus.

## ALTIMETER - SONIC

Altimètre à lecture directe pour l'aéronautique, par S. Matsuo. L'Onde électrique, Paris, July 1938, v. 17, no. 199, p. 362-71. illus.

## FLIGHT INSTRUMENTS

La Radiosonde, par Armand Avronsart. L'Echo des ailes, Brussels, May 12, 1938, v. 8, no. 19, p. 222.

L'Électricité à bord des avions, par G. Hugel. L'Electricité, Paris, Dec. 1937, Feb. 1938, v. 21-22, no. 39, 41, p. 463; 70-75.

Sonic altimeter. Electronics, New York, July 1937, v. 10, no. 7, p. 28. illus.

Acoustic altimeter. Science supplement, New York, May 28, 1937, n.s., v. 85, p. 10.

Inevitable inventions in aircraft radio, by Henry W. Roberts. Aero digest, New York, May 1937, v. 30, no. 5, p. 56-57. illus.

Acoustische en capacatieve hoogtemeters. De Werking en hun toepassing voor de luchtvaart, door B. Van Steenbergen. De Ingenieur, s'Gravenhage, Apr. 30, 1937, v. 52, no. 18, p. E 35-40. bibliog., illus.

Aeronautical and navigational instruments, by G. W. H. Gardner. Journal of scientific instruments, London, Feb. 1937, v. 14, no. 2, p. 52-56. illus.

Sonic altimeter for aircraft, by C. S. Draper. Washington, 1937. 98 p. diagrs., illus., plates. (N.A.C.A. Technical notes no. 611) (From Interavia, Geneva, Oct.2, 1937, no. 476-77, p. 8)

Radio echo altimeter, by Alexander Klemin. Scientific american, New York, Oct. 1936, v. 155, no. 4, p. 211.

L'Altimètre permanent électrique-acoustique. Revue de l'armée de l'air, Paris, Sep. 1936, v. 8, no. 86, p. 1069-74. illus.

Radio echo altitude meter, by E. F. W. Alexanderson. Aeroplane, London, Aug. 26, 1936, v. 51, no. 1318, p. 257-58. diagrs., illus. (Also Journal of the aeronautical sciences, New York, July 1936, v. 3, no. 9, p. 316-17)

Sonic altimeter for aircraft, by N. Hagio and N. Tobita. Journal of the Society of naval architects of Japan, Tokyo, June 1936, v. 58, p. 207-15.

Research of direct reading altimeter for aeronautical use by radio wave reflection method, by S. Matsuo. Institute of electrical engineers journal, Tokyo, Japan, Feb. 1936, v. 56, no. 571, p. 89-93. diagrs., illus.

Acoustic height indicator. Aircraft engineering, London, July 1935, v. 7, no. 77, p. 181-82.

La Misura dell'altezza e dell'inclinazione d'un aeroplano col metodo dell'eco, di L. P. Delsasso. L'Aerotecnica, Roma, May 1935, v. 15, no. 5, p. 541. (Also Journal of the Acoustical society of America, Chicago, July 1934, v. 6. no. 1, p. 1-15)

Ortsbestimmung durch schallmessung, von A. Berroth. Zeitschrift für vermessungswesen, Stuttgart, Feb. 1, 1935, v. 64, no. 3, p. 77-81. diagrs., maps, tables.

Un Altimetro acustico. Rivista aeronautica, Roma, Feb. 1935, v. 11, no. 2, p. 344.

Sonic altimeter tells height above earth. Popular mechanics, Chicago, Mar. 1934, v. 61, p. 361. illus.

Acoustic altimeter. Aero digest, New York, Jan. 1934, v. 24, p. 49. illus.

Fortschritte in der entwicklung der echolote, von W. Kunze. Zeitschrift des V.D.I., Berlin, Nov. 25, 1933, v. 77, no. 47, p. 1265-67. diagrs., illus. (Abstract Journal of the R.A.S., London, Oct. 1934, p. 851)

Le Sondage aérien - méthodes et appareils, par Pierre Léglise. L'Aéronautique, Paris, June-July 1933, v. 15, no. 169-70, p. 128-34; 168-70. (Abstract Journal of the R.A.S., London, Mar. 1934, p. 258)

Altimetri acustici. L'Ala d'Italia, Milano, Apr. 1933, p. 38-39. illus.

Une Nouvelle sonde pour avions, par H. Tscherning. La Nature, Paris, Feb. 1, 1933, v. 61, pt. 1, p. 100-02. illus.

Méthode de sondage, pour mesurer la hauteur des avions au dessus du sol en cas de brume, par Jean Guyot. (In Congrès international de la sécurité aérienne, Paris, 1933, v. 4, p. 39-40)

Le Probléme du sondage aérien. Bulletin de la Chambre syndicale des industries aéronautiques, Paris, 1933, no. 128, p. 121-25. diagrs.

Aparatos de a bordo para aviones - altímetro acústico. Chile aéreo, Santiago de Chile, Nov. 1932, v. 3, no. 11, p. 21-25. diagrs., illus.

Akustisches nahortungsverfahren für flugzeuge, von Georg Foges. Z.F.M., Berlin, Sep. 1932, v. 23, no. 17, p. 508-10. (Abstract Journal of the R.A.S., London, May 1933, p. 471)

## FLIGHT INSTRUMENTS

Akustische lotmittel. Zeitschrift des V.D.I., Berlin, Aug. 27, 1932, v. 76, no. 35, p. 847-49.

Sonic altimeter for aircraft, by C. W. Rice. Transactions of the A.S.M.E., New York, Apr.-June, 1932, v. 54, no. 2, p. 61-77. diagrs., illus., tables.

Altimeters whereby your ears tell your height, by C. F. Green. Western flying, Los Angeles, May 1932, v. 11, no. 5, p. 29-30. illus.

Le Sondage acoustique par échos à bord d'aéronefs bruyants, par Charles Florisson. C. R. Acad. sci., Paris, Apr. 4, 1932, no. 194, p. 1149-50.

Electrical aids to blind flying, by Alexander Klemin. Scientific american, New York, Nov. 1931, v. 145, no. 5, p. 324-26. diagrs., illus.

Sonic altimeter. Airway age, New York, Mar. 1931, v. 12, p. 279. illus.

The Behm acoustic sounder for airplanes with reference to its accuracy, by Ernest Schreiber. Washington, 1930. 18 p. diagrs., illus., tables. (N.A.C.A. Technical memorandums no. 588) (From Jahrbuch der D.V.L., München und Berlin, 1930)

Radio altimeter. Scientific american, New York, Dec. 1929, v. 141, p. 528. illus.

Radio echo altimeter protects and guides aviator. Automotive industries, New York, June 8, 1929, v. 60, no. 23, p. 885. illus.

Electrical aids to navigation, by R. H. Marriott. American institute of electrical engineers journal, New York, Mar. 1929, v. 48, p. 195-99. diagrs., illus.

Modo de determinar la altura por medio del radio - un aparato que permite al piloto conocer su altura exacta en cualquier momento. Aviación, Mexico, Feb.-Mar. 1929, v. 2, no. 6, p. 34. illus.

The Radio altimeter. Science and invention, New York, Feb. 1929, v. 16, no. 10, p. 952-53. illus.

Determination of altitude by radio, by E. F. W. Alexanderson. Airway age, New York, Jan. 1929, v. 10, no. 1, p. 55-56. diagrs.

Ears for airplanes; altitude measurements. Outlook, New York, Dec. 26, 1928, v. 150, p. 1398.

## ALTIMETER - SONIC

Il Problema delle sonde aeree, di Dino Memmo. L'Aerotecnica, Roma, Nov. 1928, v. 8, no. 11, p. 914-34. diagrs., tables.

True altitude meters, by Lawrence A. Hyland. Aviation, New York, Oct. 27, 1928, v. 25, no. 18, p. 1322-23; 1356-62. diagr., illus.

Applications of radio in the aviation field, by M. L. Muhleman. Aviation engineering, New York, Oct. 1928, v. 1, no. 1, p. 14. diagrs.

Height of airplane above ground by radio echo, by E. F. W. Alexanderson. (*In* International civil aeronautics conference. Washington, U.S. Govt. print. off., 1928. p. 613-18) (*Also* Radio engineering, New York, 1929, v. 9, p. 34-35; Science, New York, Dec. 1928, n.s., v. 68, p. 597-98 *and* Aviation engineering, New York, Dec. 1928, v. 1, no. 3, p. 12-13)

Acoustic height-indicator. Scientific american, New York, June 1927, v. 136, p. 418-19. diagrs.

La Sonde aérienne. L'Aéronautique, Paris, Aug. 1926, v. 8, no. 87, p. 269. illus.

Behm acoustic sounder for aircraft. Washington, 1926. 5 p. illus. (N.A.C.A. Technical memorandums no. 346) (*From* Flugsport, Berlin, Nov. 11, 1925)

Aparato eléctrico para la determinación de grandes altitudes. Ibérica, Tortosa, May 16, 1925, v. 12, no. 578, p. 310-11.

Das Behmlot und seine entwicklung als akustischer höhenmesser für luftfahrzeuge. Experimental-vortrag, anlässlich der tagung der Wissenschaftlichen gesellschaft für luftfahrt gehalten im Physikalischen institut der Technischen hochschule, München, september 1925, von A. Behm. München, Druck von R. Oldenbourg, 1925. 22 p. illus.

Radio tells aircraft altitude. Aerial age weekly, New York, May 22, 1922, v. 15, p. 258.

Determining the height of aeroplanes. Various methods in vogue. Scientific american supplement, New York, Dec. 24, 1910, v. 70, no. 1825, p. 412-13. diagrs.

## ALTIMETER - GENERAL

Vorrichtung zum anzeigen der höhe von luftfahrzeugen über der erd- oder der wasseroberfläche während der landung. Messtechnik, May 1938, v. 14, no. 5, p. 102.

## FLIGHT INSTRUMENTS

Instrument planning. The new service blind-flying panel described: six essential instruments correctly grouped. Flight, London, Aug. 19, 1937, v. 32, no. 1495, p. 193-95. illus.

Height-indicating apparatus for aircraft, by J. Robinson. Engineer, London, July 9, 1937, p. 59-60. illus.

La Mesure des altitudes, par R. Ange. L'Air, Paris, Mar. 20, 1937, no. 417, 1 p. illus.

Formulae for altimeter corrections, by Philip Dalton. Journal of the aeronautical sciences, New York, Feb. 1937, v. 4, no. 4, p. 154-56. diagrs.

U.S.A. Feinhöhenmesser. Interavia, Geneva, 1937, no. 404, p. 6.

Sensitive altimeter (Pioneer). Aviation, New York, Dec. 1936, v. 35, p. 39. illus. (_Also_ Aero digest, New York, Dec. 1936, v. 29, p. 54 _and_ U.S. Air services, Washington, Dec. 1936, v. 21, p. 34)

Altitude instruments. Altitude indicators, by James Ross Allen. (_In his_ Airplane instruments; theory of flight. Scranton, Pa., International text book company, 1935. p. 9-34. diagrs., illus.)

Measurement of altitude in blind flying, by W. G. Brombacher. Washington, 1934. 34 p. (N.A.C.A. Technical notes no. 503)

Thumb rules for altimeter corrections, by Frederick J. Nelson. U.S. Naval institute proceedings, Menasha, Wis., Nov. 1933, v. 59, no. 11, p. 1573-79. illus.

Gravity altimeter (Braun altitude meter), by Alexander Klemin. Scientific american, New York, Feb. 1932, v. 146, p. 110. diagrs.

The Braun relative altitude meter. Flight, London, Oct. 23, 1931, v. 23, no. 43, p. 1063. illus.

The Pilot and his altimeter, by Logan C. Ramsey. Aero digest, New York, Mar. 1931, v. 18, no. 3, p. 47, 128-32. illus.

L'Altimètre Askania à haute sensibilité. L'Aéronautique, Paris, Aug. 1930, v. 12, no. 135, p. 305. diagrs., illus.

Les Instruments de bord des avions et la navigation aérienne, par P. Franck. La Science moderne, Paris, July 1930, v. 7, no. 7, p. 313-22. illus.

Present status of aircraft instruments. Washington, U.S. Govt. print. off., 1930. 21 p. (N.A.C.A. Report no. 371)

## ALTIMETER - GENERAL

Kollsman sensitive altimeter. Aviation, New York, Nov. 2, 1929, v. 27, p. 917. illus.

New Taylor altimeters. Airway age, New York, Nov. 1929, v. 20, no. 11, p. 1832, 1834. illus.

Improved Paulin altimeter. Aviation, New York, Oct. 12, 1929, v. 27, no. 15, p. 771. illus.

New altimeter. Scientific american, New York, Oct. 1929, v. 141, p. 336-37. diagrs., illus.

Installing and servicing aircraft instruments, by J. D.Peace. Transactions of the A.S.M.E., New York, July-Sep. 1929. v. 1, no. 3, p. 167-68.

Della costruzione di un nuovo regolo per il calcolo dell'altezza e dell'azimut, di Giuseppe Simeon. Notiziario tecnico di aeronautica, Roma, June 1929, v. 7, no. 6, p. 41-46. illus. (Also Rivista aeronautica, Roma, Apr. 1929, v. 5, no. 4, p. 135-42)

Altimeters and the Paulin system level flight indicator, by Guy K. Clahoun. Airway age, New York, May 1929, v. 10, no. 5, p. 647-51. illus.

Adaptation of the Paulin system to altimeters, by Charles F. McReynolds. Aviation, New York, Feb. 16, 1929, v. 26, no. 7, p. 468-70. illus.

Paulin system altimeter. Aviation, New York, Feb. 2, 1929, v. 26, no. 5, p. 336. illus.

Aircraft instrument developments in 1928, by B. Jones. Instruments, Pittsburgh, Pa., Jan. 1929, v. 2, no. 1, p. 19-21.

Pressure element of constant logarithmic stiffness for temperature compensated altimeter, by W. G. Brombacher and F. Cordero. Washington, U.S. Govt. print. off., 1929. 13 p. diagrs. (N.A.C.A. Report no. 310)

Aeronautical instruments, by A. Karpinski. Lot Polski, Warsaw, Aug., Dec. 1928, v. 6, no. 8, 12, p. 640-43; 818-20. diagrs., illus.

A Brief historical survey of airplane instruments, by W. G. Brombacher and K. H. Beij. Popular aviation, Chicago, Dec. 1928, v. 3, no. 6, p. 40, 42, 46, 50, 52, 56, 110, 112-13. illus.

True altitude meters, by L. A. Hyland. Aviation, New York, Oct. 27, 1928, v. 25, no. 18, p. 1322-23, 1356, 1358, 1360, 1362. illus.

## FLIGHT INSTRUMENTS

Altitude indicator. Automotive industries, Philadelphia, July 14, 1928, v. 59, no. 2, p. 61.

Aircraft instruments, by Theodore C. Lonnquest. Aviation, New York, July 9, 1928, v. 25, no. 2, p. 107, 129-34. illus. (Also U.S. Naval institute proceedings, Menasha, Wis., May 1928, v. 54, no. 303, p. 405-11)

Modern development in aircraft instruments, by C. J. Stewart. Journal of the R.A.S., London, June 1928, v. 32, no. 210, p. 425-81. illus.

On the effect of temperature changes upon the altimeter, by Tadudirô Sasaki, Kunio Hattori, Ikutaro Hagiwara and Rinzi Tate. Tokyo, Tokyo imperial university, 1928. 6 p. diagrs., illus., tables. (Aeronautical research institute report no. 41)

Synopsis of french aeronautic equipment. Aeronautic instruments. Washington, 1928. 18 p. illus. (N.A.C.A. Technical memorandum no. 476) (From L'Aéronautique, Paris, Sep. 1927, no. 100)

Airplane instruments. Popular aviation, Chicago, Dec. 1927, v. 1, no. 5, p. 43-44, 64. illus.

Die Höhenmessung in der luftnavigation, von H. Koppe. (In Arbeiten zur luftnavigierung. München und Berlin, R. Oldenbourg, 1927. p. 41-63. illus.)

Altitude indicators. Scientific american, New York, July 1926, v. 135, p. 64. diagrs.

New types of aircraft instruments, by F. L. Hunt. Journal of the Optical society of America and Review of scientific instruments, Menasha, Wis., Mar. 1926, v. 12, no. 3, p. 227-69. illus.

La Précision de la mesure des records d'altitude, par F. Lindholm. L'Aéronautique, Paris, Feb. 1926, v. 8, no. 81, p. 75-78. diagrs.

Tables for calibrating altimeters and computing altitudes based on the standard atmosphere, by W. G. Brombacher. Washington, U.S. Govt. print. off., 1926. 24 p. (N.A.C.A. Report no. 246)

Instruments used by the world flyers, by George W. Polk. U.S. Air service, Washington, Feb. 1925, v. 10, no. 2, p. 31-34. illus.

Regulations governing the graduation of altimeters consequent upon the adoption of an international standard atmosphere. London, H. M. Stat. off., 1925. (Air publication no. 1173)

ALTIMETER - GENERAL

A Special F.A.I. altimeter, by F. B. Newell. Aviation, New York, June 2, 1924, v. 16, no. 22, p. 590. illus.

Concerning aneroid altimeters. Aeroplane, London, Mar. 26, 1924, v. 26, no. 13, p. 272.

Aerial navigation instruments, by G. P. Luckey. U.S. Air service, Washington, Jan. 1924, v. 9, no. 1, p. 35-38.

The Measurement of true height by aneroid, by L. N. G. Filson. Journal of scientific instruments, London, Oct. 1923, v. 1, no. 1, p. 1-8. illus.

50,000 ft. altimeter. Aviation, New York, Aug. 27, 1923, v. 15, p. 243. illus.

Airplane - height indicator for night flying. Popular mechanics, Chicago, May 1923, v. 39, p. 703. diagrs., illus.

The Instrument equipment of aeroplanes, by Charles B. Clapham. Journal and record of transactions of the Junior institution of engineers, London, Apr. 13, 1923, v. 33, p. 311-56. diagrs., illus.

Instruments for aircraft. Times trade and engineering supplement, London, Jan. 6, 1923, v. 11, no. 235, p. 399.

Pocket barometer-altimeter. Scientific american, New York, Jan. 1923, v. 128, p. 35.

Navigational equipment for long distance flights, by H. E. Wimperis. (In International air congress report for 1923. London, 1923. p. 756-65. diagrs., illus., maps)

Optical altitude indicator for night landing, by John A. C. Warner. Washington, 1923. 5 p. illus. (N.A.C.A. Technical notes no. 123) (Also Aerial age, New York, June 1923, v. 16, no. 6, p. 274-75; Flight, London, May 10, 1923, v. 15, no. 19, p. 255-56 and Aviation, New York, Mar. 12, 1923, v. 14, no. 11, p. 290-91)

New type of altimeter. Aviation, New York, Dec. 4, 1922, v. 13, p. 744.

Practical hints on aircraft instruments, by A. W. Hulbert. Aeroplane, London, Mar. 22, 1922, v. 22, no. 12, p. 210. illus.

Entfernungs- und höhenmessung in der luftfahrt, von Walther Meissner. Braunschweig, F. Vieweg und sohn, a.g., 1922. 92 p. diagrs., illus.

Mercurial barometer for airships. Aviation, New York, Nov. 14, 1921, v. 11, p. 572.

## FLIGHT INSTRUMENTS

Aeronautic instruments. Section II. Altitude instruments, by U.S. Bureau of standards. Part I. Altimeters and barographs, by A. H. Mears, H. B. Henrickson and W. G. Brombacher. Part II. Precision altimeter design, by J. B. Peterson and J. R. Freeman, Jr. Part III. Statoscopes and rate of climb indicators, by A. H. Mears. Part IV. Aerographs and strut thermometers, by J. A. C. Warner. Washington, U.S. Govt. print. off., 1921. 61 p. (N.A.C.A. Report no. 126)

Aneroid investigations in Germany, by M. D. Hersey. Washington, 1921. 9 p. (N.A.C.A. Technical notes no. 72) (Abstract Aerial age, New York, Dec. 5, 1921, v. 14, no. 13, p. 296-97)

Aeronautic instruments. General principles of construction, testing and use, by M. D. Hersey. Aviation, New York, July 1-15, 1920, v. 8, p. 437-40; 473-76. illus. (Also Aerial age, New York, May 31-June 7, 1920, v. 11, p. 403-05; 437-38; 450; Mechanical engineering, New York, May 1920, v. 45, no. 5, p. 263-68 and Transactions of the A.S.M.E., New York, 1920, v. 42, p. 83-120)

Experiments with aircraft instruments. Aircraft journal, New York, Mar. 13, 1920, v. 6, no. 11, p. 26.

Instrumente, von F. Schieferl. Osterreichische flugzeitschrift, Wien, May 1919, v. 13, no. 5, p. 65-69. diagrs.

Aeronautical instruments, by A. W. Judge. (In his Handbook of modern aeronautics. New York, D. Appleton company, 1919. p. 680-710. diagrs., illus., tables)

Tools of the german airmen. Aeronautics, London, Nov. 6, 1918, v. 15, no. 264, p. 427. diagrs. (Also Scientific american, New York, Oct. 12, 1918, v. 119, p. 297)

Navigating instruments of our aerial pilots. Scientific american, New York, Aug. 17, 1918, v. 119, p. 141.

Creep errors in altimeters due to hysteresis, by T. G. Hull. (In Instruments. London, H. M. Stat. off., 1916-1917. tables. (A.R.C. R. & M. no. 295, p. 668-70)

A New barometer. Aeronautics, London, July 26, 1916, v. 11, n.s., no. 145, p. 54. illus.

New registering altitude barometer. Aerial age, New York, Mar. 20, 1916, v. 3, no. 1, p. 11.

Aneroid barometers in the measurement of altitudes, by Richard P. Jameson. Aerial age, New York, Aug. 2, 1915, v. 1, no. 20, p. 478.

## ALTIMETER - GENERAL

Two new G.A.C. altimeters. Flight, London, Mar. 12, 1915, v. 7, no. 11, p. 186. illus.

Some G.A.C. altimeters. Flight, London, Feb. 5, 1915, v. 7, no. 6, p. 102. illus.

Short brothers new self-registering height recorder. Flight, London, Jan. 11, 1913, v. 5, no. 2, p. 37. illus.

Metodo grafico per determinare l'altezza degli aeroplani, di Giuseppe L. Pesci. Rivista tecnica di aeronautica, Roma, May-June 1911, v. 8, no. 3, p. 77-82. illus. (Translated U.S. Naval institute proceedings, Menasha, Wis., Dec. 1912, v. 38, no. 144, p. 1537)

Height recorder for balloonists. Scientific american, New York, Feb. 25, 1911, v. 101, no. 8, p. 196. illus.

Instruments used in the recording of high altitudes and their adjustment, calibration and error corrections, by Chas. E. Rilliet. Aviation, Los Angeles, Feb. 1911, v. 1, no. 2, p. 4, 13-15. illus.

Accuracy of altitude measurements, by G. H. Colt. Flight, London, Aug. 20, 1910, v. 2, no. 34, p. 676.

A Wind gauge and an altimeter, by J. J. Hicks. Flight, London, July 23, 1910, v. 2, no. 30, p. 585. illus.

Nouveau baromètre "à maxima" de contrôle, par H. Peltier. L'Aérophile, Paris, Feb. 1, 1910, v. 18, no. 3, p. 65-66. illus.

Mesure des hautes altitudes. Méthode gravimétrique de sensibilité constante, par Alphonse Berget. L'Aérophile, Paris, Feb. 15, 1909, v. 17, no. 4, p. 90.

Nouvelle méthode altimétrique applicable en ballon, par Wilfrid de Fonvielle. L'Aérophile, Paris, Feb. 1, 1909, v. 17, no. 3, p. 65.

The Altimeter. Aeronautical journal, London, 1904, v. 8, no. 30, p. 42. illus.

Appareil destiné à mesurer les hauteurs atteintes par les aérostats, par Louis P. Cailletet. C.R. Acad. sci., Paris, July-Dec. 1897, v. 125, p. 587-89.

## ARTIFICIAL HORIZON

The Sperry artificial horizon, by R. Sunnocks. Nautical magazine, London, 1938, v. 139, p. 48-50.

FLIGHT INSTRUMENTS

Instrument planning. The new service blind-flying panel described: six essential instruments correctly grouped. Flight, London, Aug. 19, 1937, v. 32, no. 1495, p. 193-95. illus.

Einige grundsätzliche gedanken über den künstlichen horizont für flugzeuge, von F. Hoppe. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4-5, p. 262-65. diagrs.

Das Verhalten des Sperryhorizonts beim stationären kurvenflug, von Erich Schmid. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, p. 283-92. illus., tables.

Aeronautical and navigational instruments, by G. W. H. Gardner. Journal of scientific instruments, London, Feb. 1937, v. 14, no. 2, p. 52-56. illus.

Behind the gyorizon. Flight, London, Feb. 27, 1936, v. 29, no. 1418, p. 235-36. diagrs., illus.

L'Horizon artificiel Sperry. Revue de l'armée de l'air, Paris, Oct. 1935, v. 2, no. 75, p. 1174-79. diagrs., illus. (Also La Nature, Paris, Aug. 1, 1935, v. 63, pt. 2, p. 118-20)

New gyro horizon (Sperry). Aviation engineering, New York, Sep. 1932, v. 7, p. 32. diagrs.

Improved gyro horizon. Aero digest, New York, July 1932, v. 21, no. 1, p. 52.

The New Sperry horizon. U. S. Air services, Washington, June 1932, v. 17, no. 6, p. 36. illus.

Flight instruments, by Charles H. Colvin. U. S. air services, Washington, Mar. 1932, v. 17, no. 3, p. 29-32. illus.

Aviator's artificial horizon, by Alexander Klemin. Scientific american, New York, Dec. 1931, v. 145, no. 6, p. 404-06. illus.

Sperry horizon gyroscope. Engineer, London, Oct. 9, 1931, v. 152, p. 371-72. diagrs., illus..

Flying with the Sperry horizon, by H. Whitel. Canadian air review, Toronto, July 1931, p. 24-25.

Gyro-horizon voids use of many navigation instruments. Aeronautical world journal of commerce, Los Angeles, Cal., Jan. 1931, p. 22.

## ARTIFICIAL HORIZON

The Artificial horizon, by Elmer A. Sperry, Jr. Aeronautical engineering, New York, Oct.-Dec. 1930, v. 2, no. 4, p. 289-91. illus.

Les Instruments de bord des avions et la navigation aérienne, par P. Franck. La Science moderne, Paris, July 1930, v. 7, no. 7, p. 313-22. illus.

The "Artificial horizon" assists pilots flying blind, by O. B. Whitaker. U.S. Air services, Washington, June 1930, v. 15, no. 6, p. 46. illus.

Artificial horizon instruments for flying blind. Aero digest, New York, June 1930, v. 16, p. 125. illus.

Artificial horizon for aircraft, by G. K. Spencer. Airway age, New York, Sep. 1929, v. 10, no. 9, p. 1407-09. illus.

The Key to the artificial horizon is recognized, by F. R. Neely. U.S. Air services, Washington, July 1928, v. 13, no. 7, p. 37-38.

German gyro gauges. The Anschutz aircraft horizon, by Alfred Gradenwitz. Aeronautics, London, June 2, 1921, n.s., v. 20, no. 398, p. 390-91. illus.

Artificial horizon and balloon sextant. Engineering, London, Mar. 1, 1912, v. 93, p. 285-86. diagrs.

A proposito del concorso per un indicatore d'orizzontalità. Bollettino della Società aeronautica italiana, Roma, June 1908, v. 5, no. 6, p. 174-75. diagrs.

Horizon gyroscopique dans le vide du contre-amiral Fleuriais, par E. Caspari. Journal de physique, thèorique et appliquée, Paris, 1897, v. 6, p. 229-38. diagrs.

## AUTOMATIC PILOT

The Pilot sits back, by N. Tangye. Popular flying, London, Sep. 1938, v. 7, no. 6, p. 294-95, 316. illus.

Making Sperry gyropilots for automatic flying. Machinery, New York, July 1938, v. 44, p. 740-41. illus.

Automatic homing; two navigational aids: D/F and automatic pilot. Flight, London, Feb. 24, 1938, v. 33, no. 1522, p. 181-82. illus.

"Who's flying this ship?" by W. A. Patterson. Saturday evening post, Philadelphia, Feb. 12, 1938, v. 210, p. 11, 52. illus.

## FLIGHT INSTRUMENTS

Toy that grew up; gyrocompass, gyropilot, gyrostabilizer, directional gyro, etc., by H. W. Magee. Popular mechanics, Chicago, Feb. 1938, v. 68, p. 188-91. diagrs., illus.

Gyroscopic instruments for instrument flying, by W. G. Brombacher and W. C. Trent. Washington, 1938. 12 p. diagrs., illus. (N.A.C.A. Technical notes no. 662)

Longitudinal stability in relation to the use of an automatic pilot, by Alexander Klemin, Perry A. Pepper and Howard A. Wittner. Washington, 1938. 45 p. charts, illus. (N.A.C.A. Technical notes no. 666)

Le Pilotage automatique des avions, par P. Franck. La Technique moderne, Paris, Nov. 15, 1937, v. 29, no. 22, p. 745-50. illus.

Aeroplane stability and the automatic pilot, by F. W. Meredith and P. A. Cooke. Journal of the R.A.S., London, June, Aug. 1937, v. 41, no. 318, 320, p. 415-36; 747-48. diagrs., illus.

Principles and practice of automatic control. British automatic aircraft pilot. Engineer, London, Apr. 2-9, 1937, v. 163, p. 380-82, 408-09. diagrs.

Principles and practice of automatic control; Minorsky automatic pilot. Engineer, London, Mar. 19-26, 1937, v. 163, p. 322-23, 352-53. diagrs.

Le Pilotage automatique en 1937, par H. Lescure. L'Air, Paris, Mar. 20, 1937, no. 417. 3 p. illus.

Principles and practice of automatic control; Henderson automatic pilot. Engineer, London, Mar. 12, 1937, v. 163, p. 294-95. diagrs.

Principles and practice of automatic control; Sperry gyro-pilot. Engineer, London, Feb. 26, Mar. 5, 1937, v. 163, p. 236-37; 268-69. diagrs.

Principles and practice of automatic control; Siemen's autopilot for aircraft. Engineer, London, Feb. 19, 1937, v. 163, p. 204-05. diagrs.

"Iron Mike," Sperry automatic pilot. Aeroplane, London, Feb. 10, 1937, v. 52, no. 1342, p. 177-78.

Gyro automatic pilot, by Philip V. H. Weems. (In his Air navigation. London, McGraw-Hill publishing company, ltd., 1937. p. 235-37. illus.)

## AUTOMATIC PILOT

Installation factor in automatic control, by D. W. Harrison. Journal of the Society of chemical industry, London, Dec. 4, 1936, v. 55, no. 49, p. 977-79.

Le Pilotage automatique des avions, par J. Delsuc. La Revue scientifique, Paris, Nov. 14, 1936, v. 74, p. 641-46. diagr., illus.

Development and principles of the gyropilot, by Preston R. Bassett. Instruments, Pittsburgh, Pa., Sep. 1936, v. 9, p. 251.

New automatic control system, by Charles J. Bauer. Popular aviation, Chicago, Sep. 1936, v. 19, no. 3, p. 33-34, diagrs., illus.

Holmes télé-compas et pilote automatique Smith. L'Aérophile, Paris, Aug. 1936, v. 44, no. 8, p. 181-85. diagrs.

Air line develops robot landing. Automotive industries, Philadelphia, Pa., May 16, 1936, p. 686. illus.

It's the top; Sperry gyro-pilot, by F. D. Morris. Collier's, New York, May 2, 1936, v. 97, p. 30. illus.

British automatic pilot for aircraft, by G. R. M. Garratt. Engineer, London, Apr. 17-24, 1936, v. 161, no. 4188-89, p. 419-22; 430-31. diagrs., illus.

The Gyropilot, by George E. Irvin. The Pilot, Los Angeles, Cal., Jan.-Feb. 1936, v. 8-9, p. 13-15; 15-23. illus.

Automatic control of airplanes. Aeroplane, London, Jan. 9, 1936, v. 48, no. 1233, p. 42-44.

Principles underlying rational solution of automatic-control problems, by S. D. Mitereff. Transactions of the A.S.M.E., New York, May 1935, Jan. 1936, v. 57-58, p. 159-63; 55-65.

Automatic stabilization, by F. Haus. Washington, 1936. (N.A.C.A. Technical memorandums no. 802) (From L'Aéronautique, Paris, Oct. 1935, Jan.-Mar. 1936, v. 17-18, no. 197, 200-02, p. 81-88; 1-6; 17-23; 29-37)

Gyroscopic stabilization instrument, by A. Fiamberti. Interavia, Geneva, 1936, no. 389-90, p. 7-8. illus.

Development of the Siemens autopilot. Aircraft, Melbourne, Aug. 1935, v. 13, no. 11, p. 6-7. diagrs., illus.

Le Dispositif de pilotage automatique des avions, système Siemens. Le Génie civil, Paris, July 20, 1935, v. 107, no. 3, p. 65-67. diagrs.

## FLIGHT INSTRUMENTS

Stabilisation automatique des avions, par J. Lacaine. La Nature, Paris, July 15, 1935, v. 63, pt. 2, p. 60-68. diagrs., illus.

Le Dispositif Gianoli de pilotage automatique. L'Aéronautique, Paris, June 1935, v. 17, no. 193, p. 163-74. diagrs., illus.

Il Comando automatico di rotta, tipo HIV, per velivoli. Rivista aeronautica, Roma, May 1935, v. 11, no. 5, p. 346-50. diagrs., illus., tables.

A German automatic pilot, by Alexander Klemin. Scientific american, New York, May 1935, v. 152, no. 5, p. 242, 278. diagrs.

Automatic pilot; aileron control, by G. R. M. Garratt. Flight, London, Mar. 28, Apr. 25, 1935, v. 27, no. 1370, 1374, p. 332a-32d; 448a-b. illus.

Le Pilotage automatique des avions, par Alfred Gradenwitz. La Nature, Paris, Apr. 1, 1935, v. 63, pt. 1, p. 312-15. diagrs., illus.

Pilotaje y estabilización automáticos, por Guy Robert. Revista de aeronáutica, Madrid, Apr. 1935, v. 4, no. 37, p. 179-84. diagrs., illus.

A New automatic pilot. Flight, London, Mar. 14, 1935, v. 27, no. 1368, p. 287-88.

The Automatic pilot, by P. R. Bassett. Journal of the aeronautical sciences, New York, Mar. 1935, v. 2, no. 2, p. 60.

Notes on automatic control, by P. W. Hill. Western gas, Los Angeles, Mar. 1935, v. 11, no. 3, p. 39-40.

Siemens automatic aircraft pilot. Engineer, London, Feb. 1, 1935, v. 159, no. 4125, p. 120-22. diagrs., illus.

Der Siemens "Autopilot," von Joachim Matthias. Deutsche flughäfen, Berlin, Jan.-Feb. 1935, v. 3, no. 1-2, p. 7-9. diagrs., illus.

German "robot" pilot. Flight, London, Jan. 10, 1935, v. 27, no. 1359, p. 41-42.

Automatic control of aeroplanes. Aeroplane, London, Jan. 9, 1935, v. 48, no. 1233, p. 42-44.

Der "Autopilot", von A. Thauss und B. von Kaull. Siemens zeitschrift, Berlin, Jan. 1935, v. 15, no. 1, p. 1-6. (Also Siemens review, Berlin, 1935, v. 11, no. 4, p. 97-103)

## AUTOMATIC PILOT

Selbststeuergerät. Interavia, Geneva, 1935, no. 214, p. 4-5. illus.

Siemens automatische flugzeugsteuerung. Flugsport, Berlin, Dec. 24, 1934, v. 26, no. 26, p. 574-78. diagrs., illus.

Nouvelle méthode d'explication qualitative du gyroscope, par P. Dapsence. La Nature, Paris, Dec. 15, 1934, v. 62, pt. 2, p. 549-53. diagrs., illus..

Le Pilotage automatique des avions. L'auto-pilote Siemens. L'Air, Paris, Dec. 15, 1934, v. 16, no. 363. 1 p. diagrs.

Automatically stabilized aeroplane. Engineer, London, Nov. 2, 1934, v. 158, p. 434.

How the auto-pilot functions, by James B. Ross. Popular aviation, Chicago, Oct. 1934, v. 15, no. 4, p. 227, 254.

Der Kreisel, seine gesetze und seine anwendung in der technik, von W. Hohmann. Werkstatt und betrieb, Munich, Sep. 10, 1934, v. 67, no. 17-18, p. 287-90.

Automatic control of aircraft, by G. R. M. Garratt. Flight, London, July 26, Aug. 30, 1934, v. 26, no. 1335, 1340, p. 49-52; 57-62.

Automatic steering control for airplanes, by Alexander Klemin. Scientific american, New York, July 1934, v. 151, p. 36. diagrs.

A New automatic pilot. Aeroplane, London, June 13, 1934, v. 46, no. 24, p. 930-31. illus.

Il Pilota automatico. L'Ala d'Italia, Milano, Jan. 1934, v. 12, p. 27-29. diagrs., illus.

Robot pilot. Canadian aviation, Toronto, Jan. 1934, p. 19.

The Parliament of dials, (Sperry automatic pilot), by P. W. Bigelow. Sportsman pilot, New York, Dec. 1933, v. 10, no. 6, p. 12-13. diagrs.

A New automatic control. Flight, London, Nov. 23, 1933, v. 25, no. 47, p. 1186.

Le "Pilote automatique" Sperry. L'Aérophile, Paris, Nov. 1933, v. 41, no. 11, p. 339-40. diagrs., illus.

Les Dispositifs gyroscopiques Sperry de pilotage automatique et le tour du monde de Wiley Post. Revue des forces aériennes, Paris, Oct. 1933, no. 51, p. 1176-81.

## FLIGHT INSTRUMENTS

Airplanes that fly themselves. Aviation, New York, July 1933, v. 32, no. 7, p. 213-15. diagrs., illus.

Automatic skiffers of the skyways. Popular mechanics, Chicago, July 1933, v. 60, no. 1, p. 1-3. illus.

The De Beeson automatic control. Aero digest, New York, July 1933, v. 23, no. 1, p. 44. illus.

The Robot pilot, by J. A. Fitz. Air transportation, East Stroudsburg, Pa., June 1933, v. 9, no. 6, p. 7-9. diagr.

Sperry automatic airplane pilot. Aero digest, New York, June 1933, v. 22, no. 6, p. 45. diagrs., illus.

L'Aiutante di pilotaggio, di G. A. Corrado Gustosa. Rivista aeronautica, Roma, May 1933, v. 9, p. 214-62. diagrs.

And now comes the automatic "robot pilot," by Keith H. Kahle. Southern aviation, Atlanta, Ga., May 1933, v. 4, no. 9, p. 13. illus.

Le Dispositif gyroscopique Smith de pilotage automatique, par Pierre Léglise. L'Aéronautique, Paris, Apr. 1933, v. 15, no. 167, p. 81-88. diagrs., illus.

Étude sur le pilotage automatique des avions, par A. Étévé. La Science aérienne, Paris, Mar.-Apr. 1933. 40 p. diagrs., illus. (Abstract C. R. Acad. sci., Paris, May 15, 1933, v. 196, no. 20, p. 1470-72)

Automatic pilots for aircraft. Air and airways, London, Jan. 1933, v. 9, no. 10, p. 349-50. illus.

Applied gyrodynamics, by E. S. Ferry. New York, J. Wiley and sons; London, Chapman and Hall,ltd., 1933. revised edition. 277 p. charts, diagrs., illus., tables.

Gyroscope, its laws and mysteries, by F. Bodde. Tientsin-Peiping, China, Peiyang press, 1933. 23 p. diagrs.

Phénomènes gyroscopiques, par M. Mathieu. Arts et métiers, Paris, Dec. 1932, v. 85, no. 147, p. 451-58.

Robot crew. Aeroplane, London, Nov. 30, 1932, v. 43, no. 22, p. 1066, 1068. illus.

Elementary theory of the gyroscope, by Peter L. Tea. Journal of the Franklin institute, Philadelphia, Sep. 1932, v. 214, no. 3, p. 299-325. diagr.

The Smith automatic pilot. Flight, London, Aug. 12, 1932, v. 24, no. 33, p. 765-66. illus.

## AUTOMATIC PILOT

Sperry automatic pilot, by Alexander Klemin. Scientific american, New York, Apr. 1932, v. 146, p. 237. diagrs.

Automatic flight, by P. R. Bassett. Western flying, Los Angeles, Cal., Feb. 1932, v. 11, no. 2, p. 24. diagrs., illus.

Automatic pilot, by J. A. Fitz. Model airplane news, New York, Feb. 1932, v. 16, no. 2, p. 39, 45. illus.

Pilotless planes of the future; first public demonstration of the Sperry gyropilot. Literary digest, New York, Jan. 2, 1932, v. 112, p. 25. (Also Scientific american, New York, Dec. 1931, v. 145, p. 371)

Description of the Sperry automatic pilot, by Elmer A. Sperry, Jr. Aviation engineering, Washington, N. J., Jan. 1932, v. 6, no. 1, p. 16-18. diagrs., illus.

Recherches et expériences sur le pilotage automatique, par A. Étévé. L'Aéronautique, Paris, Apr. 1931, Jan. 1932, v. 13-14, no. 143, 152, p. 117-21; 11-15. diagrs., illus., tables.

A Relief gear for the pilot. Aircraft engineering, London, Dec. 1931, v. 3, no. 34, p. 313-14. diagrs.

Mr. Robot, co-pilot on E.A.T. Western flying, Los Angeles, Cal., Nov. 1931, v. 10, no. 5, p. 30.

Sperry automatic pilot; device tested for civilian use. Aero digest, New York, Nov. 1931, v. 19, no. 5, p. 52. illus.

Le Applicazioni del giroscopio sul mare e nell'aria, di F. M. Leva. Rivista aeronautica, Roma, Sep. 1931, v. 7, no. 9, p. 393-402. diagrs., illus.

An Approach to automatic flight. Western flying, Los Angeles, Cal., May 1931, v. 9, no. 5, p. 31.

Automatisk kurs-styrning av flyg-plan. Flygning, Stockholm, Apr.-May 1931, v. 9, no. 40, p. 93-95. illus.

Il Pilota meccanico. Rivista aeronautica, Roma, May 1931, v. 17, no. 5, p. 331-32. illus.

Pilotaggio automatico, "Askania". L'Ala d'Italia, Milano, Mar. 1931, v. 10, no. 5, p. 228.

Robot air pilot keeps plane on true course. Popular mechanics, Chicago, Dec. 1930, v. 54, p. 950. diagrs., illus.

## FLIGHT INSTRUMENTS

Pilota automatico trifase. Rivista aeronautica, Roma, Sep. 1930, v. 6, no. 9, p. 551-57. illus.

Gyropilot goes cross-country, by Marion Huggins. Aero digest, New York, July 1930, v. 17, no. 1, p. 51-52, 208. illus.

Inventions of Dr. Elmer A. Sperry based on the gyroscope. Journal of the Franklin institute, Philadelphia, May 1930, v. 209, p. 669-77. diagrs., illus.

Il Pilota automatico Sperry. L'Ala d'Italia, Milano, Feb. 1930, v. 8, no. 2, p. 187. illus.

Automatic pilots for airplanes. Airway age, New York, Dec. 1929, v. 10, no. 12, p. 1943. illus.

Sperry automatic pilot. Aero digest, New York, Dec. 1929, v. 15, no. 6, p. 166. illus.

The Sperry gyro-compass and gyropilot, by E. L. Hill. Commonwealth engineer, Melbourne, Australia, Dec. 1929, v. 17, no. 5, p. 175-80. illus.

Gyroscopes pilot declared success. Aviation, New York, Nov. 16, 1929, v. 27, p. 990.

Automatic aeroplane control. Aviation engineering, New York, Nov. 1929, v. 2, no. 11, p. 27-28.

The Gyroscope, by P. R. Bassett. Tech engineering news, Cambridge, Mass., Oct. 1929, v. 10, no. 5, p. 182, 194, 196, 198, 200. illus.

Device for the automatic control of airplanes, by Alfred Gradenwitz. Washington, 1929. 6 p. illus. (N.A.C.A. Technical memorandums no. 495) (From Der Motorwagen, Berlin, Mar. 31, 1928)

Mechanical control of airplanes, by Hans Boykow. Washington, 1929. 25 p. diagrs. (N.A.C.A. Technical memorandums no. 504) (From Jahrbuch der W.G.L., Berlin, 1927)

Mechanics of the gyroscope, by R. F. Deimel. New York, The Macmillan company, 1929. 192 p. diagrs., illus., tables.

L'Appareil anti-roulis au type passif à gyroscopes jumelés, par E. J. Fieux. Bulletin de la Société des ingénieurs civils de France, Paris, Nov. 1928, v. 81, p. 1244-72. diagrs. (Also Le Génie civil, Paris, Feb. 4, 1928, v. 92, p. 122)

Automatic control apparatus for aeroplanes. Engineering, London, Oct. 12, 1928, v. 126, no. 3274, p. 447-49. illus.

## AUTOMATIC PILOT

Le Pilotage semi-automatique des avions, par R. Mioche. L'Aéronautique, Paris, May 1928, v. 10, no. 108, p. 155-58. illus.

Development of the gyroscope, by P. R. Bassett. Proceedings of the Brooklyn engineers' club, New York, Jan. 1928, v. 26, pt. 2, p. 9-25. illus.

Some new lecture demonstrations in gyroscopic motion, by R. C. Colwell. Science, New York, June 10, 1927, n.s., v. 65, p. 572-73. diagrs.

Principles and practice for automatic control; Siemens autopilot for aircraft. Engineer, London, Feb. 19-26 Mar. 5-26, Apr. 2-23, 1927, v. 163, p. 204-05; 236-37; 268-69; 294-95; 322-23; 352-53; 380-82; 408-09; 438-39; 467-69; 481-82. illus.

Automatic quartermaster; Sperry gyropilot. Scientific american, New York, Jan. 1926, v. 134, p. 32. illus.

Het Automatische vliegtuig, door J. W. F. Backer. Het Vliegveld, Amsterdam, Feb.-Mar. 1925, v. 9, no. 2-3, p. 46-49. illus.

New automatic stabilizer. Aviation, New York, Jan. 5, 1925, v. 18, no. 1, p. 20.

Gyroscopic motion, by L. A. Redman. Scientific american, New York, Aug. 1923, v. 129, p. 124.

Pilotless plane performs. Aviation, New York, Jan. 1, 1923, v. 14, no. 1, p. 24.

The Automatic pilot, by Ambrose Elmer Sperry. (In Report of the International congress of aerial navigation for 1923. London, 1923, p. 406-13. illus.)

Problem on the gyroscope, by I.F. Morrison. Transactions of the Royal society of Canada, Ottawa, 1923, v. 17, p. 147-50.

The Aveline automatic pilot. Aeroplane, London, Aug. 16, 1922, v. 23, no. 7, p. 127-30. diagrs., illus. (Also Flight, London, Aug. 10, 1922, p. 456)

The Aveline stabilizer. Flight, London, Oct. 27, 1921, v. 13, no. 43, p. 704.

Der Aveline-fluglagenregler. Flugwoche, Leipzig, Aug. 17, 1921, v. 3, no. 17, p. 348-49. illus.

Automatic means of control for commercial airplanes. Popular mechanics, Chicago, Aug. 1921, v. 36, no. 2, p. 222. illus.

## FLIGHT INSTRUMENTS

An Automatic pilot. Aerial age, New York, Mar. 28, 1921, v. 13, no. 3, p. 62. (Also Aeronautics, London, Feb. 3, 1921, v. 20, no. 381, p. 77 and Aeroplane, London, Feb. 2, 1921, v. 20, no. 5, p. 116)

The Aveline automatic airplane control. Aviation, New York, Mar. 21, 1921, v. 10, no. 12, p. 363-64. diagrs.

Die Dynamik des kreisels und ihre technische anwendung, von Wilhelm Hort. Zentralblatt der bauverwaltung, Berlin, Feb. 2, 5, 16, 1921, v. 41, no. 10-11, 14, p. 61-64; 67-71; 85-88. illus.

Radio compass and automatic pilot developed for naval flying boats, by J. B. Kean. Popular mechanics, Chicago, Oct. 7, 1920, v. 34, no. 4, p. 485-87. diagrs., illus.

Romance of invention; Elmer Sperry the man who harnassed the motion of the earth, by C. H. Claudy. Scientific american, New York, Apr. 17, 1920, v. 122, p. 420. illus.

Le Gyroscope et ses applications, par H. Volta. La Nature, Paris, Sep. 29, 1917, v. 45, no. 2296, p. 193-200. illus.

Clark's stabilizer and automatic control for aeroplanes, by M. E. Clark. Aero world, Brooklyn, New York, Oct. 1916, v. 1, no. 3, p. 55.

The Sperry automatic control. Aeronautics, London, Sep. 13, 1916, v. 11, no. 152, p. 175. illus.

The Sperry automatic pilot. Incorporating a gyroscopic reference plane and clinometer for airplanes. Its application for military purposes. Flying, New York, Sep. 1916, v. 5, no. 8, p. 344-46. illus.

Gyroscopic phenomena, by B. L. Newkirk. Scientific american, New York, June 12, 1915, v. 79, p. 380-81. illus.

Stability devices. Resumé of a lecture on stability and the Sperry gyroscopic stabilizer. Aerial age, New York, May 17, 1915, v. 1, no. 9, p. 207-08.

Gyrostatic action, by J. G. Gray. Scientific american supplement, New York, Mar. 13-20, 1915, v. 79, p. 172-73, 188-89. illus.

Gyrostats and gyrostatic action, by A. Gray. (In Smithsonian institution report for 1914. Washington, 1915, p. 193-208) (Also Nature, London, Apr. 10-17, 1913, v. 91, p. 148-53, 175-79)

## AUTOMATIC PILOT

Sperry gyroscopic stabilizer, by John J. Ide. Scientific american, New York, Aug. 8, 1914, v. 111, no. 5, p. 96. illus.

Schilowsky gyroscope, by J. H. Stone. Scientific american supplement, New York, July 11, 1914, v. 78, p. 28. illus.

Gyrostatic control applied to aeroplanes. Aero and hydro, Chicago, June 13, 1914, v. 8, no. 11, p. 136.

Aeroplanes and gyrostat control. Scientific american, New York, June 6, 1914, v. 110, p. 468.

Gyroscope and gyroscopic action in engineering practice, by T. R. Thomas. A.S.M.E. journal, New York, Mar. 1914, v. 36, p. 69-70.

Report on gyroscopic theory, by George Greenhill. London, Darling and son, 1914. 227 p. diagrs., plates. (Also London, H. M. Stat. off., 1914. (A.R.C. R. & M. no. 146)

Trying a gyroscope stabilizer. Aeronautics, New York, Nov. 1913, v. 13, no. 5, p. 82. illus.

Making the aeroplane safe by the gyroscopic stabilizer. Scientific american, New York, June 7, 1913, v. 108, p. 511-12. illus.

Engineering application of the gyroscope, by Elmer Ambrose Sperry. Journal of the Franklin institute, Philadelphia, Pa., May 1913, v. 175, p. 474-82. illus.

## BANK AND TURN INDICATOR

Pull in bank and turn indicator. Flight, London, Mar. 21, 1935, v. 27, no. 1369, p. 320. illus.

Development of the turn-indicator. Engineering, London, Feb. 1, 1935, v. 139, no. 3603, p. 111-12. diagrs., illus.

For safe navigation. Flight, London, June 29, 1933, v. 25, no. 26, p. 652.

A New turn indicator. Aircraft engineering, London, May 1933.

Scientific instruments and aeronautics, by H. E. Wimperis. Journal of scientific instruments, London, Nov. 1932, v. 9, no. 11, p. 337-41.

Flight instruments, by Charles H. Colvin. U. S. Air services, Washington, Mar. 1932, v. 17, no. 3, p. 29-32. illus.

## FLIGHT INSTRUMENTS

A New turn indicator. Aeroplane, London, Dec. 2, 1931, v. 41, no. 23, p. 1291-92. illus.

Electrical aids to blind flying, by Alexander Klemin. Scientific american, New York, Nov. 1931, v. 145, no. 5, p. 324-26. diagrs., illus.

The Reid-Sigrist turn indicator. Flight, London, Sep. 18, 1931, v. 23, no. 38, p. 953-54. illus.

A New turn indicator. A gyroscopic instrument with an ingenious mounting and fluid-friction drive of general application. Aircraft engineering, London, June 1931, v. 3, no. 28, p. 146. illus.

A New star on the horizon (Brown turn indicator), by S. G. Brown. Aeroplane, London, Oct. 15, 1930, v. 39, no. 16, p. 890-92. illus.

Installing and servicing aircraft instruments, by J. D. Peace. Transactions of the A.S.M.E., New York, July-Sep. 1929, v. 1, no. 3, p. 167-68.

A Brief historical survey of airplane instruments, by W. G. Brombacher and K. H. Beij. Popular aviation, Chicago, Dec. 1928, v. 3, no. 6, p. 40, 42, 46, 50, 52, 56, 110, 112-13. illus.

Aircraft instruments, by Theodore C. Lonnquest. Aviation, New York, July 9, 1928, v. 25, no. 2, p. 107, 129-34. illus. (Also U.S. Naval institute proceedings, Menasha, Wis., May 1928, v. 54, no. 303, p. 405-11)

Modern development in aircraft instruments, by C. J. Stewart. Journal of the R.A.S., London, June 1928, v. 32, no. 210, p. 425-81. illus.

Synopsis of french aeronautic equipment. Aeronautic instruments. Washington, 1928. 18 p. illus. (N.A.C.A. Technical memorandums no. 476) (From L'Aéronautique, Paris, Sep. 1927, no. 100)

Les Instruments à lecture verticale, par Charles H. Colvin. L'Aéronautique, Paris, Jan. 1927, v. 9, no. 92, p. 28.

Neigungsmesser und wendezeiger für flugzeuge, von E. Everling. (In Arbeiten zur luftnavigierung. München und Berlin, R. Oldenbourg, 1927. p. 9-31. diagrs., illus.)

New types of aircraft instruments, by F. L. Hunt. Journal of the Optical society of America and Review of scientific instruments, Menasha, Wis., Mar. 1926, v. 12, no. 3, p. 227-69. illus.

Smith's gyro turn indicator. Flight, London, June 18, 1925, v. 17, no. 25, p. 377. illus.

## BANK AND TURN INDICATOR

Un Indicateur de virage de haute précision. L'Aéronautique, Paris, May 1925, v. 7, no. 72, p. 193. illus.

Instruments used by the world flyers, by George W. Polk. U.S. Air service, Washington, Feb. 1925, v. 10, no. 2, p. 31-34. illus.

A New gyroscopic turn indicator. Flight, London, Jan. 29, 1925, v. 17, no. 5, p. 53. illus.

Istrumenti di navigazione della "Pioneer instrument company." Rendiconti tecnici della Direzione superiore del genio e costruzioni aeronautiche, Roma, Oct. 15, 1924, v. 12, no. 8, p. 8-12. illus.

Aerial navigation instruments, by G. P. Luckey. U. S. Air service, Washington, Jan. 1924, v. 9, no. 1, p. 35-38. illus.

New Pioneer flight indicator. A combined bank and turn indicator of small size and light weight. Aviation, New York, Jan. 29, 1923, v. 14, no. 5, p. 131. diagr., illus.

Aeronautical instruments, by Kurt Bennewitz. Washington, 1923. 13 p. illus. (N.A.C.A. Technical notes no. 145) (From Technische berichte, Charlottenburg, 1918, v. 3, no. 5)

Navigational equipment for long-distance flights, by H. E. Wimperis. (In International air congress report for 1923. London, 1923. p. 756-65. diagrs., illus., maps)

Electrical instrument equipment for aircraft, by Edgar A. Griffiths. Beama, London, Apr. 1922, v. 10, no. 4, p. 299-307. illus.

Aeronautic instruments: Section IV. - Direction instruments, by Bureau of standards. Part I. Inclinometers and banking indicators, by W. S. Franklin and M. H. Stillman. Part II. Testing and use of magnetic compasses for airplanes, by R. L. Sanford. Part III. Aircraft compasses; description and classification, by J. A. C. Warner. Part IV. Turn indicators, by R. C. Sylvander and E. W. Rounds. Washington, U.S. Govt. print. off., 1921. 67 p. (N.A.C.A. Report no. 128)

Design of instruments for the navigation of aircraft, by G. M. B. Dobson. Nature, London, Dec. 16, 1920, v. 106, no. 2668, p. 504-06. diagrs., illus. (Also The Geographical journal, London, Nov. 1920, v. 56, no. 5, p. 370-89)

## FLIGHT INSTRUMENTS

Airplane flight instruments, by Kurt Bennewitz. Aviation, New York, Nov. 29, 1920, v. 9, no. 11, p. 346-48. illus.

Turn and pitching indicators for airships. Aeronautics, London, Nov. 18, 1920, v. 19, no. 370, p. 356, 358. illus. (Also Aviation, New York, Oct. 15, 1920, v. 9, no. 6, p. 196)

Les Indicateurs à courbes, par H. Petit. Technique automobile et aérienne, Paris, Apr.-June, 1920, v. 2, no. 109, p. 45-51. illus.

Pioneer aircraft instruments. Aerial age weekly, New York, May 3, 1920, v. 11, no. 8, p. 257-58. illus.

The Pioneer turn indicator, by Charles H. Colvin. Aviation, New York, May 1, 1920, v. 8, no. 7, p. 283-84. illus.

The Static head turn-indicator for airplanes, by Horace Darwin. Aviation, New York, Dec. 1, 1919, v. 7, no. 9, p. 389-90. (Also Aeronautical journal, London, Dec. 1919, v. 23, no. 108, p. 617-31; Scientific american supplement, New York, Nov. 29, 1919, v. 88, no. 2288, p. 322-23; Aeronautics, London, Oct. 30, 1919, v. 17, no. 315, p. 410-12 and Flight, London, Oct. 30, 1919, v. 11, no. 44, p. 1429-31)

Gyro turns indicator. Instruments for "blind" flying. Flying, London, Feb. 26, 1919, v. 5, no. 110, p. 169.

Aircraft instruments for blind flying. Aviation, New York, Feb. 1, 1919, v. 6, no. 1, p.22.

Navigating instruments of our aerial pilots. Scientific american, New York, Aug. 17, 1918, v. 119, p. 141.

Aeronautical instruments. American machinist, New York, July 11, 1918, v. 49, p. 83.

The Sperry instruments for safety, facilitation and instruction in aerial navigation. Flying, London, June 1917, v. 6, no. 5, p. 380-81. illus.

Turn indicators for aeroplanes, by F. A. Lindemann. London, H. M. Stat. off., 1917. 8 p. diagrs., tables. A.R.C. R. & M. no. 525)

## BAROGRAPH

Ein Mechanisch registrierender barograph hoher empfindlichkeit, von G. A. Suckstorff. Zeitschrift für instrumentenkunde, Berlin, Apr. 1937, v. 57, no. 4, p. 170-71. illus.

## BAROGRAPH

Thermobarographen und modellbarographen, von D. F. S. Bauarten. Flugsport, Berlin, Apr. 1, 1936, v. 28, no. 7, p. 151-52. illus.

Measurement of altitude in record flights, by W. G. Brombacher. Journal of the aeronautical sciences, New York, Mar. 1935, v. 2, no. 2, p. 51-52.

Thermometric lag of aircraft thermometers, thermographs and barographs, by Henry B. Hendrickson. U.S. Bureau of standards journal of research, Washington, Sep. 1930, v. 5, no. 3, p. 695-709. diagrs., illus.

The Story of Friez instruments. Aero digest, New York, Oct. 1929, v. 15, no. 4, p. 160-64. illus.

Sulla teoria dei barografi altimetrici e su di un apparecchio per la loro verifica nei campi d'aviazione, di E. Oddone. Notiziario tecnico di aeronautica, Roma, July 1928, v. 6, no. 7, p. 25-48. illus.

Un Barographe "inviolable." L'Aéronautique, Paris, Mar. 1928, v. 10, no. 106, p. 104. illus.

Synopsis of french aeronautic equipment. Aeronautic instruments. Washington, 1928. 18 p. illus. (N.A.C.A. Technical memorandums no. 476) (From L'Aéronautique, Paris, Sep. 1927, no. 100)

Calculating altitudes for record purposes, by Charles H. Colvin. Aviation, New York, Oct. 8, 1923, v. 15, no. 15, p. 440.

The DeBothezat barograph; type A, by W. F. Gerhardt. Washington, U.S. Govt. print. off., 1923. 11 p. (Air information circular no. 439)

Les Essais en vol des avions nouveaux au service technique de l'aéronautique, par A. Lesage. Le Génie civil, Paris, July 22, 1922, v. 81, p. 83-87. diagrs., illus.

Air service tests new instruments. Rate of climb indicator, bubble statoscopes, and new barograph tested in balloon flights, by S. R. Winters. Aviation, New York, June 26, 1922, v. 12, no. 26, p. 755-56. illus.

Aeronautic instruments. Section II. Altitude instruments, by Bureau of standards. Part I. Altimeters and barographs, by A. H. Mears, H. B. Hendrickson and W. G. Brombacher. Part II. Precision altimeter design, by J. B. Peterson and J. R. Freeman, Jr. Part III. Statoscopes and rate of climb indicators, by A. H. Mears. Part IV. Aerographs and strut thermometers, by J. A. C. Warner. Washington, U.S. Govt. print. off., 1921. 61 p. (N.A.C.A. Report no. 126)

## FLIGHT INSTRUMENTS

Aeronautic instruments. General principles of construction, testing and use, by M. D. Hersey. Aviation, New York, July 1-15, 1920, v. 8, no. 11-12, p. 437-44; 473-76. illus. (Also Aerial age, New York, May 31-June 7, 1920, v. 11, p. 403-05; 437-38; 450; Mechanical engineering, New York, May 1920, v. 45, p. 263-68 and Transactions of the A.S.M.E., New York, 1920, v. 42, p. 83-120)

Calibration of barographs used by Major Schroeder. S.A.E. journal, New York, July 1920, v. 7, no. 1, p. 102.

A Baro-thermograph for use on aeroplanes. (In Technical report of the Advisory committee on aeronautics for 1916-1917. London, H. M. Stat. off., 1920, v. 2, p. 673-74. diagrs.)

Pour l'homologation des records d'altitude. Contrôle et mesure des records d'altitude, par Robin. L'Aérophile, Paris, Oct. 1-15, 1919, v. 27, no. 19-20, p. 290-93. illus.

A New form of barograph for the avoidance of altitude errors in aerial navigation, by J. G. Coffin. Aeronautics, London, Sep. 11, 1919, v. 17, no. 308, p. 256-57. diagrs. (Also Aviation, New York, July 15, 1919, v. 6, no. 12, p. 624-26)

German barograph no. 1623. Range 0-8000 meters. Aeroplane, London, Nov. 6, 1918, v. 15, no. 19, p. 1688, 1691. diagrs. (Also Aeronautics, London, Oct. 23, 1918, v. 15, no. 262, p. 382-84 and Flight, London, Oct. 17, 1918, v. 10, no. 42, p. 1167-68)

A Special barograph for aeroplanes. Aerial age weekly, New York, Oct. 2, 1916, v. 4, no. 3, p. 65. illus.

How barographs used during attempts on height records are tested. Flight, London, Nov. 6, 1914, v. 6, no. 45, p. 1098.

The Measurement of the true static pressure in a moving fluid - application to an aeroplane barograph, by A. F. Zahm. Journal of the Franklin institute, Philadelphia, May 1913, v. 175, no. 5, p. 503-09. diagrs.

How altitude records are made. Richard barograph. Aeronautics, New York, Feb. 1911, v. 8, no. 2, p. 71. illus. (Also Scientific american, New York, Dec. 24, 1910, v. 103, p. 500)

Methods of determining aeroplane altitudes, by Henry Harrison Suplee. Cassier's magazine, New York, Feb. 1911, v. 39, no. 4, p. 329-36. illus.

The Hygro-thermo-barograph. Ballooning and aeronautics, London, Jan. 1907, v. 1, no. 1, p. 24.

## *CLIMB INDICATOR*

L'Indicatore di salita e discesa e il suo funzionamento in quota, di Luigi Elia. L'Aerotecnica, Roma, May 1938, v. 18, no. 5, p. 646-54. diagrs.

Rate-of-climb recorder, by Helmut Danielzig. Washington, 1938. 10 p. diagrs., illus. (N.A.C.A. Technical memorandums no. 849) (From Luftwissen, Berlin, May 1937, v. 4, no. 5, p. 153-57)

Theoretische betrachtung des luftdruckvariometers und richtlinien für entwurf und prüfung, von W. Oppelt und F. Wenk. Luftfahrtforschung, München, Oct. 1937, v. 14, no. 10, p. 537-41. illus.

Algunos interesantes empleos, por Paul Olivares. Mundo aeronáutico, Buenos Aires, Apr. 1937, v. 4, no. 49. illus.

Wirkungsweise und neuere entwicklung der steiggeschwindigkeitsmesser, von W. Voelker. Luftwissen, Berlin, May 1936, v. 3, no. 5, p. 130-32. diagrs.

Climb indicators, by James Ross Allen. (In his Airplane instruments: theory of flight. Scranton, Pa., International textbook company, 1935. p. 49-51. diagrs., illus.)

Flight instruments, by Charles H. Colvin. U.S. Air services, Washington, Mar. 1932, v. 17, no. 3, p. 29-32. illus.

Strumenti moderni di bordo per aeronavigazione scientifica, Pioneer-Salmoiraghi variometer, di V. Bellini. L'Ala d'Italia, Milano, May 1931, v. 10, p. 381-82. illus.

Climb indicator. Airway age, East Stroudsburg, Pa., June 1929, v. 10, no. 6, p. 878. illus.

A Brief historical survey of airplane instruments, by W. G. Brombacher and K. H. Beij. Popular aviation, Chicago, Dec. 1928, v. 3, no. 6, p. 40, 42, 46, 50, 52, 56, 110, 112-13. illus.

Modern development in aircraft instruments, by C. J. Stewart. Journal of the R.A.S., London, June 1928, v. 32, no. 210, p. 425-81. illus.

Synopsis of french aeronautic equipment. Aeronautic instruments. Washington, 1928. 18 p. illus. (N.A.C.A. Technical memorandums no. 476) (From L'Aéronautique, Paris, Sep. 1937, no. 100)

New types of aircraft instruments, by F. L. Hunt. Journal of the Optical society of America and Review of scientific instruments, Menasha, Wis., Mar. 1926, v. 12, no. 3, p. 227-69. illus.

## FLIGHT INSTRUMENTS

Variomètre enregistreur de M. Badin. L'Aérophile, Paris, Mar. 15, 1925, v. 33, no. 5-6, p. 75-76. illus.

Optical rate-of-climb recorders; their uses, theory and description, by A. H. Mears and D. H. Strother. Journal of the Optical society of America and Review of scientific instruments, Menasha, Wis., June 1924, v. 8, no. 6, p. 787-801. illus.

Rate of climb indicator (Pioneer). Aviation, New York, Sep. 4, 1922, v. 13, p. 287.

Air service tests new instruments. Rate of climb indicator, bubble statoscopes, and new barograph tested in balloon flights, by S. R. Winters. Aviation, New York, June 26, 1922, v. 12, no. 26, p. 755-56. illus.

Electrical instrument equipment for aircraft, by Edgar A. Griffiths. Beama, London, Apr. 1922, v. 10, no. 4, p. 299-307. illus.

Aeronautic instruments. Section II. Altitude instruments, by U.S. Bureau of standards. Part I. Altimeters and barographs, by A. H. Mears, H. B. Hendrickson and W. G. Brombacher. Part II. Precision altimeter design, by J. B. Peterson and J. R. Freeman. Part III. Statoscopes and rate of climb indicators, by A. H. Mears. Part IV. Aerographs and strut thermometers, by J. A. C. Warner. Washington, U.S. Govt. print. off., 1921. 61 p. (N.A.C.A. Report no. 126)

Aeronautic instruments. General principles of construction, testing and use, by M. D. Hersey. Aviation, New York, July 1-15, 1920, v. 8, no. 11-12, p. 437-44; 473-76. illus. (Also Aerial age, New York, May 31-June 7, 1920, v. 11, p. 403-05, 437-38, 450; Mechanical engineering, New York, May 1920, v. 45, no. 5, p. 263-68 and Transactions of the A.S.M.E., New York, 1920, v. 42, p. 83-120)

Experiments with aircraft instruments. Aircraft journal, New York, Mar. 13, 1920, v. 6, no. 11, p. 26.

New aviation instruments, by S. R. Winters. Scientific american, New York, Feb. 28, 1920, v. 122, p. 211.

Rate-of-climb indicator. Washington, U.S. Govt. print. off., 1920. 3 p. illus. (Air service information circular no. 31)

Note on a rate of climb indicator for use on aeroplanes. London, H. M. Stat. off., 1917. 4 p. diagrs., tables. (A.R.C. R. & M. no. 310)

## CLIMB INDICATOR

Scientific instruments; their design and use in aeronautics, by Horace Darwin. Scientific american supplement, New York, Aug. 2, 1913, v. 76, p. 66-67. (Also Journal of the Royal society of arts, London, July 14, 1913, v. 61, no. 3163, p. 793-803; Aero and hydro, Chicago, June 28, 1913, v. 6, no. 13, p. 251, 256 and Engineering, London, May 23-30, 1913, v. 95, no. 2473-74, p. 720-22, 758)

## COMPASS - APERIODIC

Aircraft magnetic compass - standard types, by P. V. H. Weems. (In his Air navigation. New York; London, McGraw-Hill book company, 1938. p. 56-92. diagrs., illus.)

Kollsman aperiodic compass, designed for high speed long range aircraft. Aviation, New York, Oct. 1937, v. 36, p. 53. illus.

Earth's magnetism and compasses, by C. W. Martin. (In Martin's air navigation. London, Eversley press, ltd., 1937. p. 74-140. diagrs., illus., tables)

Aircraft compasses. Great Britain. Air ministry. (In Manual of air navigation. London, H. M. Stat. off., 1935. p. 153-70. diagrs., illus.) (Air publication no. 1234)

A Cheap compass for light aeroplanes (Sestrel compass). Aeroplane, London, Feb. 10, 1932, v. 42, no. 6, p. 251. illus.

The Compass, by Frank Arthur Swoffer. (In his Air navigation for the private owner. London, Sir Isaac Pitman and sons, ltd., 1931. p. 41-62. charts, diagrs., illus.)

The Compass, by Oliver Stewart. (In his Cross country flying. London, Constable and company, ltd., 1931. p. 22-23. diagrs., illus.)

Aerial navigation - aircraft compasses. Part I - Aperiodic compasses, by Douglas G. Jeffrey. Aeronautics, Chicago, Apr. 1930, v. 6, no. 4, p. 317-18, 340.

Improvements in aircraft compasses. Engineering, London, Nov. 9, 1923, v. 116, p. 600.

Navigational equipment for long-distance flights, by H. E. Wimperis. (In International air congress report for 1923. London, 1923, p. 756-65. diagrs., illus., maps)

Tests on improved models of aircraft compasses. London, H. M. Stat. off., 1923. 4 p. diagrs. (A.R.C. R. & M. no. 868)

FLIGHT INSTRUMENTS

The Aperiodic magnetic compass. Aeronautics, London, May 12, 1921, n.s., v. 20, no. 395, p. 345. illus.

## COMPASS - DEVIATION, COMPENSATION

Northerly turning error of the magnetic compass for aircraft, by C. S. Draper, W. H. Cook and Walter McKay. Journal of the aeronautical sciences, New York, July 1938, v. 5, no. 9, p. 345-54. charts, diagrs.

Aircraft magnetic compass - standard types, by P. V. H. Weems. (In his Air navigation. New York; London, McGraw-Hill book company, 1938. p. 56-92. diagrs., illus.)

Le Compas est-il la cause de l'échec des raids vers le Japon? par L. Saharov. Les Ailes, Paris, Apr. 22, 1937, v. 17, no. 827, p. 7. diagrs.

La Régulation des compas en vol, par J. Hartog et M. Boel. L'Aéronautique, Paris, Apr. 1937, v. 19, no. 215, p. 49-54. illus. (Also Aeroplane, London, Oct. 21, 1936, v. 51, no. 1326, p. 515)

Compass errors explained, by J. A. McGillivray. Flight, London, Feb. 18, 1937, v. 31, no. 1469, p. 168.

Le Changement de nord, par Jean Delsuc. Revue du Ministère de l'air, Paris, Sep. 15, 1936, v. 2, no. 21, p. 1129-38. diagrs.

Clipper compass check. Aviation, New York, May 1936, v. 34, no. 5, p. 192-93. illus.

Aircraft compass characteristics, by John B. Peterson and Clyde W. Smith. Washington, U.S. Govt. print. off., 1936. 11 p. diagrs., tables. (N.A.C.A. Report no. 551)

Les Compas d'aviation. Cours élémentaire de compensation et d'emploi à l'usage des candidats chefs de bord de l'armée de l'air et des candidats aux divers brevets de navigation aérienne, par Robert Gaujour. Paris, Lavauzelle, 1936. 172 p. diagrs., illus., maps, tables.

Der Magnetkompass beim kurvenflug, von W. Immler. Annalen der hydrographie und maritime meteorologie, Berlin, June 15, 1935, v. 63, no. 6, p. 241-44. tables.

Compass corrections in military aviation, by P. Kissam. Military engineer, Washington, May-June, 1935, v. 27, no. 153, p. 174-77.

## COMPASS - DEVIATION, COMPENSATION

La Locura de la brújula, por Manuel Martínez Merino. Revista de aeronáutica, Madrid, Feb. 1935, v. 4, no. 35, p. 58-60. diagrs., illus.

Compass errors and compensation, by Frank Wilbur Wead and James Ross Allen. (In their Practical flying and meteorology. Scranton, Pa., International text book company, 1935. p. 19-50. diagrs., illus., maps)

Practical compass adjustment. Great Britain. Air ministry. (In Manual of air navigation. London, H. M. Stat. off., 1935. p. 179-96. diagrs., tables) (Air publication no. 1234)

Correcting the airplane's magnetic compass, by N. H. Heck. Air commerce bulletin, Washington, Oct. 15, 1934, v. 6, no. 4, p. 75-76.

Instruments; repair, overhaul, testing, and calibration of aircraft and aero-engine instruments; adjustment; installation and compensation of compasses in aircraft, by R. W. Sloley. London, Sir Isaac Pitman and sons, ltd., 1934. 81 p. diagrs., illus.

Kinematographische kompass-studien im flugzeug 1931, von A. Ritscher, W. Immler und Klein-Schoenbeck. Z.F.M., München und Berlin, Apr. 13, 28, 1933, v. 24, no. 7-8, p. 185-93; 213-21. charts, diagrs., illus.

Compass swinging afloat. Aero digest, New York, Oct. 1931, v. 19, no. 4, p. 51. diagrs.

Compensating the compass. Aviation engineering, New York, June 1931, v. 4, no. 6, p. 36-37.

The Pilot and the compass error, by Logan C. Ramsey. Aero digest, New York, May 1931, v. 18, no. 5, p. 58-59.

Aircraft compass acceleration errors and their compensation, by J. D. Tear and E. J. Lawton. General electric review, New York, Apr. 1931, v. 34, no. 4, p. 265-68. diagrs.

Elementary magnetism. Calculating deviation - compass-swinging - swinging bases, by Leslie S. Potter. (In his The Navigation of the air and meteorology. New York; London, Harper and brothers, 1931. p. 154-76. diagrs., illus., tables)

Variation and deviation of magnetic type compasses, by Harvey Hodges Holland. (In his Avigation, New York; London, McGraw-Hill book company, inc., 1931. p. 72-95. diagrs., illus., tables)

## FLIGHT INSTRUMENTS

Norddrehfehler und deviation, von H. Maurer. Z.F.M., München, July 14, 1930, v. 21, no. 13, p. 333-35. illus.

La Régulation des compas montés sur avions, par Max Dévé. Revue des forces aériennes, Paris, July 1930, no. 12, p. 821-28. diagrs.

Aircraft compass problems, by T. R. Rhea. Pacific aviation news, Portland, Ore., July 1929, v. 2, no. 7, p. 6-8. diagrs. (Also General electric review, New York, Apr. 1929, v. 32, no. 4, p. 190-93)

How and why of navigation. Compass and its idiosyn, by George R. Fairlamb, Jr. Airway age, New York, July 1929, v. 10, no. 7, p. 990-93.

Het Gevaar van verandering in de afwijking van het kompas voor het vliegtuig, door J. P. F. van der Mieden Van Opmeer. Het Vliegveld, Amsterdam, June 1929, v. 13, no. 6, p. 227-28.

How to swing your compass, by H. C. Gatty. Airway age, New York, May 1929, v. 10, no. 5, p. 623-24.

Compass errors and compensation, by Lewis A. Yancey. (In his Aerial navigation and meteorology. New York, The Norman W. Henley publishing company, 1929. p. 45-100. charts, diagrs., maps, tables)

Das Kompensieren von magnetkompassen in flugzeugen, von W. Pacher. Die Luftwacht, Berlin, Nov. 1927, no. 11, p. 644-49. illus.

The Installation and correction of compasses in airplanes, by M. F. Schoeffel. Washington, 1927. 17 p. diagrs., tables. (N.A.C.A. Technical notes no. 262)

Beitrag zur theorie der kompasstörungen, von D. Thoma. Z.F.M. , Berlin, Dec. 14, 1925, v. 16, no. 23, p. 486-87.

Moet een luchtvaartcompas cardanisch opgehangen worden? door Van der Hoop. Het Vliegveld, Amsterdam, Dec. 1922, v. 6, no. 12, p. 302-04.

Das Problem der kompassablenkung durch zusätzliche beschleunigungsfelder, von H. Boykow. Z.F.M., Berlin, June 15, 1922, v. 13, no. 11, p. 161-63.

The Northerly turning error of compasses in aircraft, by A. P. Rowe. London, H. M. Stat. off., 1921. 7 p. diagrs. (A.R.C. R. & M. no. 875)

Some characteristics of aircraft compasses, by H. E. Wimperis and A. P. Rowe. London, H. M. Stat. off., 1921. 5 p. diagrs. (A.R.C. R. & M. no. 735)

## COMPASS - DEVIATION, COMPENSATION

Preliminary report on the forced oscillations of aircraft compasses, by R. S. Capon and A. Lee. London, H. M. Stat. off., 1920. 9 p. diagrs., plates. (A.R.C. R. & M. No. 874)

When the compass goes crazy, by C. H. Claudy. Scientific american, New York, Aug. 30, 1919, v. 121, p. 204.

A New compass deviation card for aircraft. Flight, London, May 23, 1918, v. 10, no. 21, p. 565-66. diagrs.

Instruction for installing and testing a compass on an aeroplane, by N. Kalitin. Petrograd, 1918. 44 p. diagrs.

Eliminating deviations of the airplane compass. The Automobile and automotive industries, New York, Sep. 13, 1917, v. 37, no. 11, p. 440.

The Compass in aeronautics, by Louis A. Bauer. Aerial age weekly, New York, Aug. 27, 1917, v. 5, no. 24, p. 869.

Navigation, magnetism and deviation of the compass. Great Britain. Air ministry. London, H. M. Stat. off., 1917. (Air publication no. 256)

Compass deviation due to vibration and friction between the cup and pivot, by A. Mallock. (In Compass deviation in aircraft. London, H. M. Stat. off., 1915-1916. diagrs. (A.R.C. R. & M. no. 238, p. 536-39)

Compass deviation due to vibration, without friction, by G. Greenhill. (In Compass deviation in aircraft, London, H. M. Stat. off., 1915-1916. diagrs. (A.R.C. R. & M. no. 238, p. 539-53)

The Northerly turning error of the magnetic compass, by F. A. Lindemann. (In Instruments. London, H. M. Stat. off., 1916. (A.R.C. R. & M. no. 295, p. 678-86)

Report on the errors of compasses on aeroplanes, by Keith Lucas. (In Compass deviation in aircraft. London, H. M. Stat. off., 1915-1916. diagrs., tables. (A.R.C. R. & M. no. 238, p. 554-67)

Instruments used on airplanes; comments on their functions and defects. Scientific american supplement, New York, July 10, 1915, v. 80, no. 2062, p. 23.

Kompasstörungen im nebel, von Wilhelm Krebs. Motorwagen, Berlin, Jan. 10, 1915, v. 18, no. 1, p. 12-13.

## FLIGHT INSTRUMENTS

Boussoles d'aviation compensables. L'Aérophile, Paris, June 1, 1911, v. 19, no. 11, p. 257.

## EARTH INDUCTOR

Earth inductor compass, by P. V. H. Weems. (In his Air navigation. New York; London, McGraw-Hill book company, 1938. p. 96-97. diagrs., illus.)

Finding your way in the air. Part II- Compasses, by P. V. H. Weems. Aviation, New York, July 1937, v. 36, no. 7, p. 22-23, 68, 71.

The Mechanics of the inductor compass, by Charles L. Turner. Western flying, Los Angeles, Cal., Aug. 1936, v. 16, no. 8, p. 19-20. diagrs.

Tipi particolari di bussole ad induzione ed applicazioni, di G. Giulietti. Elettrotecnica, Milano, Apr. 25, 1936, v. 23, no. 8, p. 231-36.

Aero navigation. Part II- Compasses, by D. G. Jeffrey. Canadian air review, Toronto, July 1931, v. 4, no. 5, p. 37-40. illus.

The Development of air navigation, by C. R. McMullin. Aircraft engineering, London, Sep. 1930, v. 2, no. 19, p. 232-33. illus.

Aerial navigation - aircraft compasses. Part II- Earth inductor compass and gyroscopic compass, by Douglas G. Jeffrey. Aeronautics, Chicago, May 1930, v. 6, no. 5, p. 401-02, 432.

Safe flying through use of instruments, by W. G. Brown. Aviation engineering, New York, Jan. 1930, v. 3, no. 1, p. 21-24.

Electrical aids to navigation, by R. H. Marriott. Journal of the American institute of electrical engineers, New York, Mar. 1929, v. 48, p. 195-99. diagrs., illus.

Aircraft instruments for overseas navigation, by Victor E. Carbonara. S.A.E. journal, New York, Nov. 1927, v. 21, p. 528-31. illus.

Le Compas à induction terrestre. L'Aérophile, Paris, Aug. 1-15, 1927, v. 35, no. 15-16, p. 242. diagrs.

The Pioneer earth inductor compass, by M. M. Titterington. Flight, London, Aug. 4, 1927, v. 19, no. 31, p. 534-35. diagrs. (Also Aviation, New York, June 20, 1927, v. 22, no. 25, p. 1356-57, 1400)

## COMPASS - EARTH INDUCTOR

Earth inductor compass used by Lindbergh, by M. M. Titterington. U.S. Air service, Washington, July 1927, v. 12, p. 25-26, 52. illus.

The Pioneer earth inductor compass, by Charles H. Colvin. Slipstream, Dayton, Ohio, Nov. 1925, July 1927, v. 6, 8, p. 25-26; 23, 25. diagrs., illus.

Le Compas Pioneer, à induction magnétique terrestre, pour la navigation aérienne. Le Génie civil, Paris, June 25, 1927, v. 90, p. 630-31. diagrs., illus. (Also L'Aérophile, Paris, June 15, 1927, v. 35, no. 11-12, p. 168)

The Earth inductor compass, by Brice Goldsborough. Aero digest, New York, June 1927, v. 10, no. 6, p. 542, 544. illus.

The Pioneer earth inductor compass. Aeroplane, London, Feb. 2, 1927, v. 32, no. 5, p. 128-30. illus.

New types of aircraft instruments, by F. L. Hunt. Journal of the Optical society of America and Review of scientific instruments, Menasha, Wis., Mar. 1926, v. 12, no. 3, p. 227-69. illus.

Direction and position instruments, by Herbert N. Eaton, K. Hilding Beij and William G. Brombacher. (In Aircraft instruments. New York, The Ronald press company, 1926. p. 99-130. illus.)

Earth induction compass, by George P. Luckey. Mechanical engineering, New York, Oct. 1925, v. 47, no. 10, p. 795-96. diagrs., illus.

The New Pioneer earth inductor compass. Aviation, New York, June 8, 1925, v. 18, no. 23, p. 643. illus.

New compass makes flying safer. Automotive industries, Philadelphia, May 7, 1925, v. 52, no. 19, p. 829. illus.

Instruments used by the world flyers, by George W. Polk. U.S. Air service, Washington, Feb. 1925, v. 10, no. 2, p. 31-34. illus.

Pioneer instruments company perfects inductor compass. Slipstream, Dayton, Ohio, Feb. 1925, v. 6, no. 2, p. 14. illus.

The Pioneer earth inductor compass. Aviation, New York, June 9, 1924, v. 16, no. 23, p. 616-17. diagrs., illus.

New airplane compass. Aviation, New York, Feb. 13, 1922, v. 12, no. 7, p. 204. (Also Aerial age, New York, Feb. 13, 1922, v. 14, p. 537)

Earth inductor compass, by Paul R. Heyl and Lyman J. Briggs. Proceedings of the American philosophical society, Philadelphia, 1922, v. 61, p. 15-32. diagrs., illus. (Abstract U.S. Air service, Washington, Nov.-Dec. 1922, v. 7, no. 10-11, p. 30-33; 31-33)

## COMPASS - GYRO

Toy that grew up; gyrocompass, gyropilot, gyrostabilizer and directional gyro, etc., by H. W. Magee. Popular mechanics, Chicago, Feb. 1938, v. 69, p. 188-91. diagrs., illus.

Gyroscopic instruments for instrument flying, by W. G. Brombacher and W. C. Trent. Washington, 1938. 37 p. (N.A.C.A. Technical notes no. 662)

Finding your way in air. Part II - Compasses, by P. V. H. Weems. Aviation, New York, July 1937, v. 36, no. 7, p. 22-23, 68, 71.

Les Nouveaux compas d'aviation, par J. Delsuc. La Nature, Paris, May 1, 1936, v. 64, pt. 1, p. 392-95. diagrs., illus.

Der Kreiselkompass auf flugzeugen, von J. W. Geckeler. (In Jahrbuch der Lilienthal-gesellschaft für luftfahrtforschung. Berlin, 1936. p. 504-12)

Sperry gyro-compass. Great Britain. Admiralty. London, H. M. Stat. off., 1936. (Manual of 1931, Addenda no. 1, June 1936)

Compas Sperry à rose stabilizée par gyroscope, formant horizon artificiel, par L. Aussenac et P. Léglise. Revue de l'armée de l'air, Paris, Nov. 1935, v. 7, no. 76, p. 1305-08. illus.

Le Compas gyroscopique d'aviation Delsuc à direction magnétique. Revue de l'armée de l'air, Paris, Oct. 1935, v. 7, no. 75, p. 1187-92. illus.

Kreiselmechanik des Anschütz-raumkompasses, von J. W. Geckeler. Ingenier archiv, Berlin, Aug. 1935, v. 6, no. 4, p. 229-52. diagrs., illus.

Étude synthétique des compas gyrostatiques, par M. Monfraix.. Bulletin de l'Association technique, maritime et aéronautique, Paris, 1934, p. 109-35.

L'Aiutante di pilotaggio, di Corrado Gustosa. Rivista aeronautica, Roma, May 1933, v. 9, p. 214-62. diagrs., illus.

## COMPASS - GYRO

Aero navigation. Part II - Compasses, by Douglas G. Jeffrey. Canadian air review, Toronto, July 1931, v. 4, no. 5, p. 37-40. illus.

Asservissement et répétition du cap des compas gyroscopiques système Saint-Chamond-Granat. Bulletin technique du Bureau véritas, Paris, Nov. 1930, v. 12, no. 11, p. 226-29. illus.

Les Instruments de bord des avions et la navigation aérienne, par P. Franck. La Science moderne, Paris, July 1930, v. 7, no. 7, p. 313-22. illus.

Aerial navigation - aircraft compasses. Part II - Earth inductor compass and gyroscopic compass, by Douglas G. Jeffrey. Aeronautics, Chicago, May 1930, v. 6, no. 5, p. 401-02, 432.

The Sperry gyro-compass and gyropilot, by E. L. Hill. Commonwealth engineer, Melbourne, Australia, Dec. 1929, v. 17, no. 5, p. 175-80. illus.

The Theory of the gyroscopic compass and its deviations, by Arthur L. Rawlings. London, MacMillan, 1929. 191 p. diagrs., illus.

Les Compas gyroscopiques employés à bord des navires et des aéronefs, par G. Malgorn. Le Génie civil, Paris, Jan. 14, 1928, v. 92, no. 2, p. 37-42. illus.

Réalisation d'un compas gyrostatique zénithal amorti, par H. Beghin et P. Monfaix. C. R. Acad. sci., Paris, Nov. 15, 1926, v. 183, no. 20, p. 856-58. diagr., illus.

Sur les compas gyrostatiques Anschütz et Sperry, par H. Beghin. C. R. Acad. sci., Paris, Aug. 1, 1921, v. 173, no. 5, p. 288-90.

Principles of the gyro-compass, by G. B. Crouse. Mechanical engineering, New York, Nov. 1920, v. 42, p. 619-23. diagrs., illus.

El Giro-compás, por Rafael Vargas. Tohtli, Mexico, Sep. 1920, v. 5, no. 2, p. 54-56. diagrs., illus.

Gyrostatic compass, by Sidney G. Brown. Engineering, London, Feb. 13, 1920, v. 109, p. 202-06. diagrs., illus., table.

The Gyroscopic compass; a non-mathematical treatment, by Thomas W. Chalmers. London, Constable and company, ltd., 1920. 167 p. diagrs., illus.

## FLIGHT INSTRUMENTS

The Sperry gyro-compass and navigation equipment. Brooklyn, Sperry gyroscope company, 1915. 76 p. 3rd edition. diagrs., illus.

Sperry gyro-compass. Engineering magazine, New York, Aug. 1912, v. 43, no. 5, p. 754-57. diagrs., illus.

The Gyro compass (Anschütz). Flight, London, Oct. 28, 1911, v. 3, no. 43, p. 941.

The Elliott "gyro" compass. Flight, London, May 6, 1911, v. 3, no. 18, p. 408.

Der Anschütz gyro-kompass. Kiel, Anschütz und co., 1910. 109 p. illus. English translation by G.K.B. Elphinstone. London, Elliott brothers, 1910.

## COMPASS - MAGNETIC

Aircraft magnetic compass - standard types, by P. V. H. Weems. (In his Air navigation. New York; London, McGraw-Hill book company, 1938. p. 56-92. diagrs., illus.)

Earth's magnetism and compasses, by C. W. Martin. (In Martin's air navigation. London, Eversley press, ltd., 1937. p. 74-140. diagrs., illus., tables)

Le Nouveau compas magnétique Aera, type E-10. Revue de l'Armée de l'air, Paris, Sep. 1936, v. 8, no. 86, p. 1063-66. diagrs., illus.

Les Nouveaux compas d'aviation, par J. Delsuc. La Nature, Paris, May 1, 1936, v. 64, pt. 1, p. 392-95. diagrs., illus.

"True direction" aircraft instrument question, by R. Gunn. Instruments, Pittsburgh, Pa., May 1935, v. 8, no. 5, p. 119.

Dynamic coefficients of the aircraft magnetic compass, by Walter McKay. Journal of the aeronautical sciences, New York, Mar. 1935, v. 2, no. 2, p. 60.

Relativity's reality foils development of "true direction" instrument for aircraft, by A. M. Dudley. Instruments, Pittsburgh, Pa., Feb. 1935, v. 8, no. 2, p. 30-31.

Uber einen trägheitslosen flugzeugkompass, von W. Ende und M. H. Glöckner. Z.F.M., Berlin, Oct. 28, 1932, v. 23, no. 20, p. 603-09. diagrs., illus., table.

## COMPASS - MAGNETIC

Pioneer straightway compass. Scientific american, New York, Apr. 1931, v. 144, p. 268, 270. illus. (Also Automotive industries, Philadelphia, Dec. 13, 1930, v. 63, p. 876-77)

La Bussola magnetica in volo, di M. Tenani. L'Aerotecnica, Roma, May 1930, v. 10, no. 5, p. 369-77. illus., tables.

Cobalt-steel magnets in aircraft compasses, by J. H. Gier. Electric journal, Pittsburgh, Pa., Feb., Apr. 1930, v. 27, p. 114-15; 236-37. diagrs., illus.

Magneto compass now on market. Airway age, New York, Apr. 1930, v. 11, no. 4, p. 564. illus.

Kelvin, Bottomley and Baird, ltd. Pioneers in design and construction of aircraft compasses. (In Air annual of the British Empire. London, 1930. v. 2, p. 628-35. illus.)

La Bussola italiana "Velivoli" per aeromobili. L'Ala d'Italia, Milano, June 1929, v. 8, no. 6, p. 561.

Magneto compass. Airway age, New York, June 1929, v. 10, no. 6, p. 836. illus.

The Magneto compass, by F. P. Wills. Aero digest, New York, May 1929, v. 14, no. 5, p. 72, 74, 254, 256. illus.

Der Magnetkompass als aeronautisches instrument, von H. Coldewey. Z.F.M., München, Feb. 28, 1929, v. 20, no. 4, p. 94-96.

A Brief historical survey of airplane instruments, by W. G. Brombacher and K. H. Beij. Popular aviation, Chicago, Dec. 1928, v. 3, no. 6, p. 40, 42, 46, 50, 52, 56, 110, 112-13. illus.

Improved Pioneer magnetic compass. Airway age, New York, Dec. 1928, v. 9, no. 12, p. 92-94. illus. (Also Aero digest, New York, Dec. 1928, v. 13, no. 6, p. 1172, 1174 and U.S. Air services, Washington, Nov. 1928, v. 13, no. 11, p. 50)

Titterington compensator installed in Pioneer magnetic compass. Aviation, New York, Oct. 20, 1928, v. 25, no. 17, p. 1274. illus.

Aircraft instruments, by Theodore C. Lonnquest. Aviation, New York, July 9, 1928, v. 25, no. 2, p. 107, 129-34. illus. (Also U.S. Naval institute proceedings, Menasha, Wis., May 1928, v. 54, no. 303, p. 405-11)

FLIGHT INSTRUMENTS

Magnetic compass type N.S. III. Aviation, New York, July 9, 1928, v. 25, no. 2, p. 130-31. illus.

Aircraft instruments for overseas navigation, by Victor E. Carbonara. S.A.E. journal, New York, Nov. 1927, v. 21, p. 528-31. illus.

Direction and position instruments, by Herbert N. Eaton, K. Hilding Beij and William G. Brombacher. (In Aircraft instruments. New York, The Ronald press company, 1926. p. 99-130. illus.)

Istrumenti di navigazione della "Pioneer instrument company." Rendiconti tecnici della Direzione superiore del genio e costruzioni aeronautiche, Roma, Oct. 15, 1924, v. 12, no. 8, p. 8-12. illus.

Aerial navigation instruments, by G. P. Luckey. U. S. Air service, Washington, Jan. 1924, v. 9, no. 1, p. 35-38.

Improvements in aircraft compasses. Engineering, London, Nov. 9, 1923, v. 116, p. 600.

Tests on improved models of aircraft compasses. London, H. M. Stat. off., 1923. 4 p. diagrs. (A.R.C. R. & M. no. 868)

The Magnetic compass in aircraft. Great Britain. Air ministry. London, H. M. Stat. off., 1922. 23 p. illus., plates. (Air publication no. 802)

Deadbeat magnetic compass for aerial navigation. Popular mechanics, Chicago, Dec. 1921, v. 36, p. 889. illus.

Aeronautic instruments. Section IV. Direction instruments, by U.S. Bureau of standards. Part I. Inclinometers and banking indicators, by W. S. Franklin and M. H. Stillman. Part II. Testing and use of magnetic compasses for airplanes, by R. L. Sanford. Part III. Aircraft compasses, description and classification, by J.A.C. Warner. Part IV. Turn indicators, by R. C. Sylvander and E. W. Rounds. Washington, U.S. Govt. print. off., 1921. 67 p. (N.A.C.A. Report no. 128)

Pioneer aircraft instruments. Aerial age weekly, New York, May 3, 1920, v. 11, no. 8, p. 257-58. illus.

Testing of magnetic compasses, by R. L. Sanford. Washington, U.S. Govt. print. off., 1920. 7 p. (Bureau of standards scientific papers no. 382)

## COMPASS - MAGNETIC

Navigational magnetic compass considered as an instrument of precision, by M. B. Field. Scientific american supplement, New York, Nov. 22, 1919, v. 88, p. 302-03. (Also Journal of the Institute of electrical engineers, New York, May 1919, v. 57, p. 349-86)

The Pentz compass for aviation. Aviation, New York, Mar. 15, 1919, v. 6, no. 4, p. 233.

Compas perfectionné de direction en navigation aérienne, par H. Vincent. L'Aérophile, Paris, May 1-15, 1918, v. 26, no. 9-10, p. 133-36. illus.

Aviator's compass which is visible at night by its own light. Scientific american, New York, Feb. 10, 1917, v. 116, p. 156. illus.

Equilibrium of the magnetic compass in aeroplanes, by S. G. Starling. The London, Edinburgh and Dublin philosophical magazine and journal of science, London, Nov. 1916, v. 32, no. 191, p. 461-76. illus.

On a new type of magnetic compass for use on aeroplanes, by K. Lucas. (In Compass deviation in aircraft. London, H. M. Stat. off., 1915-1916. diagrs., illus., tables. (A.R.C. R. & M. no. 238, p. 567-75)

"Guidance." The Aeroplane compass. Flight, London, Aug. 13, 1915, v. 7, no. 33, p. 590-92. illus.

Flugrichtungskompass, System Wäller, von Gustav E. Macholz. Osterreichische flugzeitschrift, Wien, Feb. 15, 1914, v. 8, no. 3-4, p. 42-43.

The Clift compasses. Aeronautics, London, Feb. 1913, v. 6, no. 60, p. 46-47. illus.

A New compass. Flight, London, July 20, 1912, v. 4, no. 29, p. 661. diagrs.

The Magnetic compass - its construction and use, by Eric Hollocoombe Clift. Flight, London, Feb. 24-Mar. 2, 1912, v. 4, no. 8-9, p. 163-65; 190-201. illus.

How to find your way in the air (Daloz compass). Scientific american, New York, July 8, 1911, v. 105, p. 24-26. illus.

The "Clift" patent aeroplane compass. Aeronautics, London, May 1911, v. 4, no. 39, p. 62. illus.

De la direction des aéroplanes. L'Aéro, Paris, Apr. 9, 1911, v. 3, no. 49, p. 275-76. diagrs.

## FLIGHT INSTRUMENTS

A New aeroplane compass. Aeronautical journal, London, Apr. 1911, v. 15, no. 58, p. 91. illus.

Novel compass for aeroplanes. The needle points out the direction of travel. Scientific american, New York, Mar. 4, 1911, v. 104, p. 230. illus.

Boussole, système G. Daloz, pour l'aéronautique. Le Génie civil, Paris, Feb. 11, 1911, v. 58, no. 15, p. 315. diagrs.

The Daloz compass, by René Ozouf. Flight, London, Jan. 14, 1911, v. 3, no. 2, p. 38.

De la direction automatique des engins volants dans l'espace et de l'"Anémo-boussole," par A. Baron. La Revue aérienne, Paris, Dec. 10, 1910, v. 3, no. 52, p. 677-80. diagrs.

## COMPASS - SUN

Goerz and Bumstead sun compass, by P. V. H. Weems. (In Air navigation. London; New York, McGraw-Hill publishing company, 1938. p. 99-100. illus.)

Finding your way in air. Part II - Compasses, by P. V. H. Weems. Aviation, New York, July 1937, v. 36, no. 7, p. 22-23, 68, 71.

Sun compass, by Frank Wilbur Wead and James Ross Allen. (In their Practical flying and meteorology. Scranton, Pa., International text book company, 1935. p. 40-41. diagrs., illus.)

The Bumstead sun compass. Aero digest, New York, July 1930, v. 17, no. 1, p. 124-25. illus.

Sun compass. Scientific american, New York, Mar. 1930, v. 142, p. 233. illus.

Commander Byrd's new type compass. Flight, London, Dec. 27, 1929, v. 21, no. 52, p. 1349.

Eine Fehlerquelle des sonnenkompass, von H. Maurer. Z.F.M., München, Mar. 15, 1929, v. 20, no. 7, p. 170-72. illus., map, table.

Are we over the pole? by N. R. Clarke. Scientific american, New York, Sep. 1926, v. 135, p. 188-89. illus.

## COMPASS - SUN

Goerz sun compass, by Herbert N. Eaton, K. Hilding Beij and William G. Brombacher. (In Aircraft instruments. New York, The Ronald press company, 1926. p. 226-27. illus.)

Sun compass. Scientific american, New York, Nov. 1924, v. 131, p. 332.

## COMPASS - TELEMAGNETIC

Holmes telecompass, by P. V. H. Weems. (In his Air navigation. New York; London, McGraw-Hill book company, 1938. p. 93-96. diagrs., illus.)

Tube "Repeats" aircraft compass bearings. Electronics, New York, July 1937, v. 10, no. 7, p. 28.

Remote reading compass. Aviation, New York, May 1937, v. 36, p. 48-49. illus.

West telemagnetic compass. Aviation, New York, May 1937, v. 36, no. 4, p. 48-49. (Also Aero digest, New York, Mar. 1937, v. 30, no. 3, p. 38)

Aeronautical and navigational instruments, by G. W. H. Gardner. Journal of scientific instruments, London, Feb. 1937, v. 14, no. 2, p. 56-66.

Bussola a distanza ad induzione magnetica per navigazione aerea, di G. Giulietti. L'Elettrotecnica, Milano, Jan. 10, 1937, v. 24, no. 1, p. 16-18.

Télécompas Holmes et pilote automatique Smith. L'Aérophile, Paris, Aug. 1936. 4 p. illus.

Compas à distance, par L. Griselin. La Science aérienne, Paris, Mar.-Apr. 1936, v. 5, no. 2, p. 73-95. illus.

Recent developments in Pioneer aircraft instruments, by George Tate. Aviation engineering, New York, Oct. 1932, v. 7, no. 4, p. 16-17. diagrs., illus.

Télécompas et stabilisateur automatique de cap, système Askania, pour la direction des avions. Le Génie civil, Paris, Apr. 30, 1932, v. 100, no. 18, p. 443-46. diagrs., illus.

Pioneer compass for aeroplanes. Automotive industries, Philadelphia, Dec.19, 1931, v. 65, p. 972. diagrs.

Deux nouvelles boussoles. Le Télécompas Askania à transmission pneumatique; le compas magnétique Aéra 6 NB. L'Aéronautique, Paris, Aug. 1931, v. 13, no. 147, p. 303-04. illus.

## FLIGHT INSTRUMENTS

Aero navigation. Part II - Compasses, by Douglas G. Jeffrey. Canadian air review, Toronto, July 1931, v. 4, no. 5, p. 37-40. illus.

Bussola magnetica con trasmettitore pneumatico a distanza. Rivista aeronautica, Roma, Mar. 1931, v. 7, no. 3, p. 540-42. illus.

Die Entwicklung des fernkompasses und seine bedeutung für die automatische steuerung, von W. Möller. Z.F.M., München, Dec. 29, 1930, v. 21, no. 24, p. 640-45. illus.

Ein Magnetkompass mit pneumatischer fernübertragung, von Friedrich Hauptmann. Deutsche luftfahrt, Berlin-Charlottenburg, Sep. 1930, v. 34, no. 9, p. 232-34. diagrs., illus.

The Magnetic compasses with remote control. Aircraft engineering, London, Oct. 1929, v. 1, no. 1, p. 278. diagr., illus.

Airplane recording compass. Scientific american, New York, Aug. 1926, v. 135, p. 145. illus.

Boussole à sélénium pour aéroplane, par E. Weiss. La Nature, Paris, Sep. 2, 1922, v. 50, no. 2526, p. 151-53. illus.

Electrical instrument equipment for aircraft, by Edgar A. Griffiths. Beama, London, Apr. 1922, v. 10, no. 4, p. 299-307. illus.

The Distant compass, by Walter Friedensburg. Aerial age, New York, Aug. 29, 1921, v. 13, no. 25, p. 587-89. diagrs.

A Remote control compass (Bamberg), by Alfred Gradenwitz. Aviation, New York, Jan. 3, 1921, v. 10, no. 1, p. 19-20. illus.

Selenium aviation compass placed on tail of plane. Popular mechanics, Chicago, Dec. 1920, v. 34, p. 840.

New aviator's compass (Bamberg tele-compass). Automotive industries, New York, Nov. 25, 1920, v. 43, p. 1058. illus.

Foreign aviation instruments (Bamberg compass). Aerial age, New York, Nov. 1, 1920, v. 12, p. 229.

Bamberg distant compass. Journal of the American institute of engineers, New York, Nov. 1920, v. 39, p. 975.

## COMPASS - TELEMAGNETIC

Distant reading german airplane compass. Scientific american monthly, New York, Nov. 1920, v. 2, p. 274.

## COMPASS - GENERAL

Earth's magnetism and compasses, by C. W. Martin. (In his Martin's air navigation. London, The Eversley press, ltd., 1938. p. 73-143)

Les Vicissitudes du compas d'aviation, par Jean Sylvestre. L'Air, Paris, Mar. 20, 1937, no. 417. 2 p. illus.

Magnetism, compasses and aircraft instruments, by D. C. T. Bennett. (In his The Complete air navigator. London, Sir Isaac Pitman and sons, ltd., 1937. p. 80-128. diagrs., tables)

Aircraft compass characteristics, by J. B. Peterson and C. W. Smith. Washington, U.S. Govt. print. off., 1936. 11 p. (N.A.C.A. Report no. 551)

Aircraft compasses. Great Britain. Air ministry. (In Manual of air navigation. London, H. M. Stat. off., 1935. p. 153-70. diagrs., illus.) (Air publication no. 1234)

The Pilot and his aircraft compass, by Logan C. Ramsey. Aero digest, New York, Apr. 1931, v. 18, no. 4, p. 54-55, 226. illus.

Compasses and their care, by Leslie S. Potter. Aero digest, New York, Jan. 1931, v. 18, no. 1, p. 58-59. illus.

The Compass, by Frank Arthur Swoffer. (In his Air navigation for the private owner. London; New York, Sir Isaac Pitman and sons, ltd., 1931. p. 41-62. charts, diagrs., illus.)

The Compass, by Oliver Stewart. (In his Cross country flying. London, Constable and company, ltd., 1931. p. 22-33. diagrs., illus.)

Magnetism and the compass, by Bradley Jones. (In his Avigation. New York, John Wiley and sons, 1931. p. 6-31. charts, diagrs., illus., tables)

The Compass, by Logan C. Ramsey. (In his The Navigation of aircraft. New York, The Ronald press company, 1929. p. 29-54. diagrs., illus.)

FLIGHT INSTRUMENTS

Modern development in aircraft instruments, by C. J. Stewart. Journal of the R.A.S., London, June 1928, v. 32, no. 120, p. 425-81. illus.

How Lindbergh got across, by Bradley Jones. Instruments, Pittsburgh, May 1928, v. 1, no. 5, p. 223-27. illus.

Airplane instruments. Popular aviation, Chicago, Dec. 1927, v. 1, no. 5, p. 43-44, 64. illus.

Der Kompass im luftfahrzeug Folgerungen aus der entwicklung des seekompasswesens nach theorie und praxis, von H. Meldau. Z.F.M., München, July 26-Aug. 26, 1924, v. 15, no. 13-14, 15-16, p. 147-50; 167-70. diagrs.

Het Tegenwoordige vliegtuigkompas, door A. J. L. Moritz. Het Vliegveld, Amsterdam, Sep. 1922, v. 6, no. 9, p. 229-30. diagrs.

The Aeroplane compass during change of speed and course. Aeronautics, London, May 19, 1921, n.s., v. 20, no. 396, p. 358.

Le Compas de navigation aérienne, par J. Rouch. Paris, Masson et cie., 1921. 72 p. charts, diagrs., tables.

Design of instruments for navigation of aircraft, by G. M. B. Dobson. Geographical journal, London, Nov. 1920, v. 56, no. 5, p. 370-89. diagrs., illus.

Istrumenti per la navigazione aerea. Rivista marittima, Roma, Oct. 1920, v. 53, p. 155-56.

Strumenti aeronautici, di M. Tenani. L'Aeronauta, Roma, Mar. 1920, v. 3, no. 1, p. 123.

Aeronautical instruments, by A. W. Judge. (In his Handbook of modern aeronautics. New York, D. Appleton company; London, The Library press, 1919. p. 680-710. diagrs., illus., tables)

Compasses for aerial navigation. U.S. Air service. Washington, 1919. 18 p. diagrs., illus. (U.S. War department document no. 921)

The Pilot's "office." Instruments for air use, by William A. Robson. Scientific american supplement, New York, Nov. 2, 1918, v. 86, p. 285. (Also Flight, London, Aug. 15, 1918, v. 10, no. 33, p. 911)

Navigating instruments for our aerial pilots. Scientific american, New York, Aug. 17, 1918, v. 119, p. 141.

## COMPASS - GENERAL

Flugzeugkompasswesen und flugsteuerkunde, von Werner Immler. Berlin-Charlottenburg, C. J. E. Volckmann nachf., g.m.b.h., 1918. 141 p. diagrs., illus., tables.

Apparecchi e metodi di navigazione aerea, di M. Tenani. La Rivista italiana di aeronautica, Roma, Feb. 1917, v. 12, no. 2, p. 29-35. diagrs.

Equations of motion of the compass. Part II, by D. H. Pinsent. (*In his* Instruments. London, H. M. Stat. off., 1916-1917. charts, diagrs., illus. (A.R.C. R. & M. no. 295, p. 687-98)

Aeroplane instruments. Aircraft, New York, Sep.-Oct. 1915, v. 6, no. 7, p. 513.

The Use of the compass in aviation, by Samuel S. Pierce. Aerial age, New York, Apr. 19, 1915, v. 1, no. 5, p. 111, 116. illus. (*Also* Flying, New York, Nov. 1914, v. 3, no. 10, p. 300)

Scientific instruments used in aeronautics: devices for determining direction, speed and side-slip, by Horace Darwin. Engineering magazine, New York, Sep. 1913, v. 45, p. 878-80.

Der Kompass im flugzeug, von R. Topp. Der Motorwagen, Berlin, Dec. 20, 1912, v. 35, p. 809-13. diagrs., tables.

Uber Kompasse für luftfahrzeuge, von Georg Gehlhoff. Deutsche luftfahrer-zeitschrift, Berlin, July 24, 1912, v. 16, no. 15, p. 369-70.

Ein Neuer kompass für flugzeuge, von H. H. Kritzinger. Deutsche luftfahrer-zeitschrift, Berlin, May 29, 1912, v. 16, no. 11, p. 278-79. illus.

Les Nouvelles inventions concernant la locomotion aérienne. Une boussole pour aviateurs. La Technique aéronautique, Paris, Nov. 15, 1911, Apr. 15, 1912, v. 4-5, no. 46, 56, p. 310-11; 250-51. illus.

The Aeroplane compass, by Eric Hollocoombe Clift. Aeronautics, London, Aug. 1911, v. 4, no. 42, p. 121-22.

Aerial compasses, by W. Batty. Flight, London, May 27, 1911, v. 3, no. 21, p. 473. diagrs.

Une Nouvelle boussole. La Conquête de l'air, Bruxelles, May 1, 1911, v. 8, no. 9, p. 3.

Steering by compass. Flight, London, Apr. 22, 1911, v. 3, no. 16, p. 360.

## FLIGHT INSTRUMENTS

Notations simples sur l'aide par l'usage du compas dans les navigations au-dessus des terres, par L. Byasson. L'Aérophile, Paris, Feb. 15, 1911, v. 19, no. 4, p. 88-91. diagrs.

Compasses and aeroplanes. Flight, London, Jan. 28, 1911, v. 3, no. 4, p. 78.

Aero-compass. Aero, London, Dec. 21, 1910, v. 3, no. 83, p. 500. illus.

La Boussole aérienne, par G. Daloz. Revue aérienne, Paris, Nov. 25, 1910, v. 3, no. 51, p. 652-58. diagrs.

## DRIFT AND SPEED INDICATOR

Course and drift indicator. (In Handbook of aeronautics. London, Sir Isaac Pitman and sons, ltd., 1938. v. 1, p. 510-11. diagrs.

"Windicator" for determining compass bearing correction to allow for winds of known velocity and direction. Aero digest, New York, Sep. 1937, v. 31, p. 76. diagrs.

Le Viseur dérivomètre "Altiscope" Richard. Revue de l'armée de l'air, Paris, June 1937, v. 9, no. 95, p. 709-12. illus.

A Convenient drift and speed indicator, by Alexander Klemin. Scientific american, New York, Apr. 1936, v. 154, p. 200-01.

Gatty's ground speed meter, by Alexander Klemin. Scientific american, New York, May 1935, v. 152, p. 242. diagrs., illus.

Gatty ground speed meter, by P. V. H. Weems. Flight, London, Jan. 24, 1935, v. 27, no. 1361, p. 96. diagrs. (Also Aero digest, New York, Jan. 1935, v. 26, no. 1, p. 47) (Abstract Scientific american, New York, May 1935, v. 152, p. 242)

Les Cinémadérivomètres modernes, par Aussenac. L'Aéronautique, Paris, Apr. 1934, v. 16, no. 179, p. 77-82.

Considerazioni sul cinemo-derivometro Gatty, di Giuseppe Simeon. Rivista aeronautica, Roma, Dec. 1932, v. 8, no. 12, p. 562-67.

Misuratore del vento e di deriva Immler. Rivista aeronautica, Roma, Aug. 1932, v. 8, no. 8, p. 410-19. diagrs., illus.

# DRIFT AND SPEED INDICATOR

L'Estimateur Arcaute pour le calcul de la vitesse de route et de la dérive. L'Aéronautique, Paris, Apr. 1932, v. 14, no. 155, p. 109-11. illus.

The Gatty ground speed and drift indicator, by P. V. H. Weems. The Air legion aeronautical news, Washington, Dec. 4, 1931, v. 1, no. 1, p. 3-6. illus.

The Menendez drift indicator. Aero digest, New York, Oct. 1931, v. 19, p. 80. diagrs.

New drift indicator. Scientific american, New York, Aug. 1931, v. 145, p. 123. illus.

Blind man's buff in the air, by J. E. Smith. Aero news and mechanics, New York, Feb. 1930, v. 2, no. 1, p. 62-63, 67-68. illus.

A Brief historical survey of airplane instruments, by W. G. Brombacher and K. H. Beij. Popular aviation, Chicago, Dec. 1928, v. 3, no. 6, p. 40, 42, 46, 50, 52, 56, 110, 112-13. illus.

Pioneer drift indicator. Aero digest, New York, Aug. 1928, v. 13, no. 2, p. 254. illus.

Ground speed indicator, by A. Hofmann. Instruments, Pittsburgh, Pa., July 1928, v. 1, no. 7, p. 327.

Modern development in aircraft instruments, by C. J. Stewart. Journal of the R.A.S., London, June 1928, v. 32, no. 210, p. 425-81. illus.

Synopsis of french aeronautic equipment. Aeronautic instruments. Washington, 1928. 18 p. illus. (N.A.C.A. Technical memorandums no. 476) (From L'Aéronautique, Paris, Sep. 1927, no. 100)

Aircraft instruments for overseas navigation, by Victor E. Carbonara. S.A.E. journal, New York, Nov. 1927, v. 21, no. 5, p. 528-31. illus.

Speed and drift indicator (Pioneer). Scientific american, New York, July 1926, v. 135, p. 65. illus.

New types of aircraft instruments, by F. L. Hunt. Journal of the Optical society of America and Review of scientific instruments, Menasha, Wis., Mar. 1926, v. 12, no. 3, p. 227-69. illus.

Istrumenti di navigazione della "Pioneer instrument company." Rendiconti tecnici della Direzione superiore del genio e costruzioni aeronautiche, Roma, Oct. 15, 1924, v. 12, no. 8, p. 8-12. illus.

## DRIFT AND SPEED INDICATOR

Air navigation instruments (excluding compasses). Great Britain. Air ministry. London, H. M. Stat. off., 1924. 28 p. diagrs., illus. (Air publication no. 803)

Navigational equipment for long-distance flights, by H. E. Wimperis. (In International air congress report for 1923. London, 1923. p. 756-65. diagrs., illus., maps)

Driftograph, a new method of aerial navigation. Scientific american monthly, New York, May 1921, v. 3, no. 5, p. 553-54. diagrs.

Correcteur de route à dérivographe pour la navigation aérienne à l'estime. L'Aéronautique, Paris, Nov.-Dec. 1920, v. 2, no. 18, p. 227-32. illus. (Also L'Aérophile, Paris, Nov. 1-15, 1920, v. 28, no. 22-23, p. 326-32)

Navigation instruments. Aeronautics, London, Dec. 11, 1919, v. 17, no. 321, p. 527. diagrs.

Speedriftometer. A new american instrument. Aeronautics, London, Sep. 11, 1919, v. 17, no. 308, p. 265-66. diagrs.

New navigating instruments made for transatlantic flight. S.A.E. journal, New York, July 1919, v. 5, no. 1, p. 77. (Also Automotive industries, Philadelphia, May 22, 1919, v. 40, p. 1135)

The Sperry instruments for safety, facilitation and instruction in aerial navigation. Flying, London, June 1917, v. 6, no. 5, p. 380-81. illus.

Aeronautical equipment which lightens the work of the aviator. Scientific american, New York, Feb. 10, 1917, v. 116, p. 156. illus.

The Sperry drift indicator. Flight, London, Aug. 27, 1915, v. 7, no. 35, p. 629. illus.

## INCLINOMETER

A Brief historical survey of airplane instruments, by W. G. Brombacher and K. H. Beij. Popular aviation, Chicago, Dec. 1928, v. 3, no. 6, p. 40, 42, 46, 50, 52, 56, 110, 112-13. illus.

Synopsis of french aeronautic equipment. Aeronautic instruments. Washington, 1928. 18 p. illus. (N.A.C.A. Technical memorandums no. 476) (From L'Aéronautique, Paris, Sep. 1927, no. 100)

## INCLINOMETER

Airplane instruments. Popular aviation, Chicago, Dec. 1927, v. 1, no. 5, p. 43-44, 64. illus.

Neigungsmesser und wendezeiger für flugzeuge, von E. Everling. (In Arbeiten zur luftnavigierung. München und Berlin, R. Oldenbourg, 1927. p. 9-31. diagrs., illus.)

Uber die frage der neigungsmessung in flugbetrieb, von H. List. Zeitschrift des V.D.I., Berlin, July 3, 1926, v. 70, no. 27, p. 921-23. illus.

New types of aircraft instruments, by F. L. Hunt. Journal of the Optical society of America and Review of scientific instruments, Menasha, Wis., Mar. 1926, v. 12, no. 3, p. 227-69. illus.

Aerial navigation instruments, by G. P. Luckey. U.S. Air service, Washington, Jan. 1924, v. 9, no. 1, p. 35-38.

Aeronautical instruments, by Kurt Bennewitz. Washington, 1923. 13 p. illus. (N.A.C.A. Technical notes no. 145) (From Technische berichte, Charlottenburg, 1918, v. 3, no. 5)

Twin-dial inclinometer of great precision. Popular mechanics, Chicago, Dec. 1921, v. 36, p. 854. illus.

Aeronautic instruments. Section IV. Direction instruments, by U.S. Bureau of standards. Part I. Inclinometers and banking indicators, by W. S. Franklin and M. H. Stillman. Part II. Testing and use of magnetic compasses for airplanes, by R. L. Sanford. Part III. Aircraft compasses, description and classification, by J. A. C. Warner. Part IV. Turn indicators, by R. C. Sylvander and E. W. Rounds. Washington, U.S. Govt. print. off., 1921. 67 p. (N.A.C.A. Report no. 128)

Special inclinometers and indicators. Aviation, New York, Nov. 22, 1920, v. 9, no. 10, p. 322-23. illus.

Aircraft incidence meter. Everyday engineering magazine, New York, May 1920, v. 9, no. 2, p. 137. illus.

The Sanford clinometer. Aerial age, New York, Feb. 9, 1920, v. 10, no. 17, p. 634. illus.

Development of an aircraft incidence meter, by A. F. Zahm. Aviation, New York, Dec. 15, 1919, v. 7, no. 10, p. 432. diagrs. (Also Journal of the Franklin institute, Philadelphia, Nov. 1919, v. 188, p. 683-85 and Aeronautics, London, Dec. 11, 1919, v. 17, no. 321, p. 531)

## FLIGHT INSTRUMENTS

The Clayton clinometer. Aeroplane, London, Dec. 3, 1919, v. 17, no. 23, p. 1868. illus.

Aeronautical instruments, by A. W. Judge. (In his Handbook of modern aeronautics. New York, D. Appleton and company; London, The Library press, 1919. p. 680-710. diagrs., illus., tables)

The Pilot's office. Instruments for air use, by William A. Robson. Scientific american supplement, New York, Nov. 2, 1918, v. 86, p. 285. (Also Flight, London, Aug. 15, 1918, v. 10, no. 33, p. 911)

The Sperry instruments for safety, facilitation and instruction in aerial navigation. Flying, London, June 1917, v. 6, no. 6, p. 380-81. illus.

The Sperry clinometer. Aeroplane, London, Apr. 25, 1917, v. 12, no. 17, p. 1036. illus.

Aeronautical equipment which lightens the work of the aviator. Scientific american, New York, Feb. 10, 1917, v. 116, p. 156. illus.

Signals aviator to keep the aeroplane level. Aerial age weekly, New York, Feb. 5, 1917, v. 4, no. 21, p. 539. illus.

New model Wright incidence indicator. Aeronautics, New York, Feb. 16, 1916, n.s., v. 10, no. 122, p. 116. illus.

Wright incidence indicator brought out. Aero and hydro, Chicago, Aug. 9, 1913, v. 6, no. 19, p. 380. illus.

Gough-Turner clinometer, by R. V. Tivy. Flight, London, May 25, 1912, v. 4, no. 21, p. 478.

The Gough-Turner clinometer, by H. G. Turner. Flight, London, May 11, 1912, v. 4, no. 19, p. 424. illus.

## PANEL

La Protection des instruments de bord contre les vibrations, par J. Delsuc. L'Air, Paris, July 1, 1938, no. 448, p. 419. diagrs., illus.

Groupement des instruments sur le tableau de bord, par Jules Hartog et Maurice Boel. L'Écho des ailes, Bruxelles, Feb. 3, 1938, v. 8, no. 5, p. 53-54.

Instrument planning. The new service blind-flying panel described: six essential instruments correctly grouped. Flight, London, Aug. 19, 1937, v. 32, no. 1495, p. 193-95. illus.

## PANEL

L'Éclairage des instruments de bord, par M. Brunat. E.S.N.A., (École nationale supérieure d'aéronautique), Paris, Mar.-Apr., 1937. 5 p. illus.

Anti-vibration mountings of instruments. Flight, London, Apr. 23, 1936, v. 29, no. 1426, p. 435. diagrs.

Leuchtende stoffe für bordgeräte, von F. Wiegand. Luftwissen, Berlin, Mar. 1936. 1 p.

Spannungen, denen die elektrischen bordgeräte ausgesetzt sind, von Hofmann und Hellwig. Luftwissen, Berlin, Feb. 1936, 8 p. diagrs., illus.

Current practise in instrument panel layout. Aero digest, New York, Aug., Sep., Oct., Dec. 1935, v. 27, no. 2-4, 6, p. 40-44; 42-45; 78-79; 40-42. diagrs., illus.

Instrument accessibility. Aviation, New York, Dec. 1935, v. 34, p. 32-33. illus. (Board in Dr. Light's Bellanca Skyrocket)

Standard panel arrangement for flight instruments. Air commerce bulletin, Washington, Oct. 15, 1935, v. 7, no. 4, p. 88-90. illus.

Le Poste de pilotage du Douglas D. C. 2. L'Aéronautique, Paris, Sep. 1935, v. 17, p. 228-29. diagrs., illus.

Vultee transport instrument installations, by William L. Lewis. Aero digest, New York, Sep. 1935, v. 27, no. 3, p. 46-47. illus.

Un Tableau de bord à suspension amortie, par R. E. Badin. L'Aéronautique, Paris, Apr. 1934, v. 16, p. 43-44. illus.

Anti-vibration mounting of airplane instruments, by S. J. Zand and L. N. Swisher. U.S. Air services, Washington, June 1933, v. 18, p. 26-31. diagrs., illus. (Abstract Aeroplane, London, Oct. 17, 1934, v. 47, no. 1221, p. 459-60)

New transport instrument board. Aviation, New York, Dec. 1932, v. 31, p. 491. illus.

Instrument board explained, by L. J. Van Sickle. Popular aviation, Chicago, Mar. 1932, v. 10, p. 153-55, 190-91. illus.

A Study of airplane and instrument board vibration, by S. J. Zand. S.A.E. journal, New York, Oct. 1, 1931, v. 29, no. 4, p. 263-79, 315. illus., tables.

## FLIGHT INSTRUMENTS

Airplane instrument vibration. Transactions of the A.S.M.E., New York, 1931, v. 53, no. 13, p. 105-09. (Abstract L'Aerotecnica, Roma, Jan. 1935, v. 15, no. 1, p. 60)

Aménagement des planches de bord. L'Aéronautique, Paris, Feb., Nov. 1930, v. 12, no. 129, 138, p. 51-54; 414-20. illus.

Borgeräte-ausrüstung der am internationalen rundflug 1930 beteiligten flugzeuge, von Georg Wollé und Oskar Passoth. Z.F.M., München, Oct. 14, 1930, v. 21, no. 19, p. 508-12. illus.

Bord- und navigationsgeräte, vorrichtungen und ausrüstung bei neuzeitlichen handelsflugzeugen. Junkers nachrichten, Dessau, Anhalt, May 4, 1930. 13 p. diagrs., illus.

Essais des instruments de bord aux vibrations. L'Aéronautique, Paris, Jan. 1930, v. 12, no. 128, p. 23-25. illus.

Installing and servicing aircraft instruments, by J. D. Peace. Transactions of the A.S.M.E., New York, July-Sep. 1929, v. 1, no. 3, p. 167-68.

Learning to use our wings. A flush instrument board, by Alexander Klemin. Scientific american, New York, July 1929, v. 141, no. 1, p. 70-73. illus.

Disposition des instruments de bord. L'Aéronautique, Paris, Apr. 1926, v. 8, no. 83, p. 145-46. illus.

Les Installations techniques de bord des gros avions modernes, par J. A. Lefranc. La Nature, Paris, Aug. 8-15, 1925, v. 53, p. 84-91, 106-10. diagrs., illus.

Orte für die messgeräte an flugzeugen, von F. Ahlborn. Z.F.M., München, Jan. 14, 1925, v. 16, no. 1, p. 2-3. illus.

Instrument board displayed at Gothenberg. U.S. Air services, Washington, Sep. 1923, v. 8, no. 9, p. 35. illus.

The New vertical scale instrument and compass board. U.S. Air service, war department, engineering division technical orders (Air service information circular) Dayton, Ohio, July-Aug. 1923, v. 5, no. 428, p. 20-23. illus.

The Instrument equipment of aeroplanes, by Charles B. Clapham. Journal and record of transactions of the Junior institution of engineers, London, Apr. 13, 1923, v. 33, p. 311-56. diagrs., illus.

Simplifying the instrument board. Aviation, New York, Mar. 27, 1922, v. 12, no. 13, p. 363.

## PANEL

The Pilot's "office". Instruments for air use, by William A. Robson. Flight, London, Aug. 15, 1918, v. 10, no. 33, p. 911.

## RADIO DIRECTION FINDER

Errors in radiogomiometers, by S. B. Smith and J. F. Hatch. Marconi review, London, Oct.-Dec. 1938, no. 71, p. 9-15.

Lear ARC - 6 automatic radio direction finder. Canadian aviation, Toronto, Dec. 1938, v. 11, no. 12, p. 18.

More automatic D/F. Flight, London, Nov. 17, 1938, v. 34, no. 1560, p. 445. diagrs.

"Index Finger" D-F. (Sperry - RCA direction finder). Aviation, New York, Nov. 1938, v. 37, no. 11, p. 49, 80.

New direction finder - Robots are getting smarter, by Bradley Jones. U.S. Air services, Washington, Nov. 1938, v. 23, no. 11, p. 24.

Sperry - RCA automatic direction finder. Canadian aviation, Toronto, Nov. 1938, v. 11, no. 11, p. 21, 24.

Automatic direction finder. Communications, New York, Oct. 1938, v. 18, no. 10, p. 10-11, 28-29.

Empleo de ondas cortas y largas para la navegación aérea y aterrizaje a ciegas de aviones, por D. Sirito. Revista militar, Buenos Aires, July 1938, v. 38, no. 450, p. 121-27.

El Radiocompás Learadio Arc-5. Avia, Buenos Aires, June-July 1938, v. 3, no. 24, p. 137-38. illus.

Lear developments. Aviation, New York, June 1938, v. 37, no. 6, p. 42, 45. illus. (Also Aero digest, New York, May 1938, v. 32, p. 88)

Der Lorenz-langwellen - U-Adcock - peiler, von K. Koschmieder. Lorenz berichte, Berlin-Tempehlhof, June, 1938, no. 1-2, p. 41-53.

Les Récents progrès de la radiogoniométrie, par O. Heer Le Génie civil, Paris, May 7, 1938, v. 112, no. 2908, p. 395-96.

Coast guard radio (direction finders), by D. Fink. Aviation, New York, May 1938, v. 37, no. 5, p. 48-49, 70. illus.

## FLIGHT INSTRUMENTS

Some design considerations in Adcock direction finders, by H. W. Roberts. Aero digest, New York, May 1938, v. 32, no. 5, p. 52, 54, 60. diagrs.

Simon radioguide, double-loop direction finder. Aviation, New York, Apr. 1938, v. 37, p. 63. illus. (Also Aero digest, New York, Apr. 1938, v. 32, p. 72)

Flugzeug-funkpeilkompass, von H. Colberg. Zeitschrift für fernmeldetechnik, Berlin, Mar. 15, 1938, v. 19, no. 3, p. 38-40.

Radio compass in air navigation, by R. G. Nichols. Air commerce bulletin, Washington, Mar. 15, 1938, v. 9, no. 9, p. 203-12.

Nuevo radio compás Fairchild. Avia, Buenos Aires, Mar. 1938, v. 3, no. 22, p. 77-78. illus.

Bendix type MN-12A radio compass. Aero digest, New York, Feb. 1938, v. 32, p. 78. illus.

Fairchild eigenpeiler RC 4. Interavia, Geneva, Nov. 2, 1937, no. 486, p. 6. illus.

Aircraft radio; new equipment for communication and navigation, by K. Henney and D. G. Fink. Aviation, New York, Nov. 1937, v. 36, p. 44-45. illus.

Improved medium - wave Adcock direction finder, by R. H. Barfield and R. A. Fereday. Journal of the Institution of electrical engineers, London, Nov. 1937, v. 81, no. 491, p. 676-81.

Short wave Adcock direction-finder, by R. H. Barfield and W. Ross. Journal of the Institution of electrical engineers, London, Nov. 1937, v. 81, no. 491, p. 682-90.

Fairchild RC-4 aircraft radio direction finder. Aero digest, New York, Sep. 1937, v. 31, p. 92. illus.

Bendix direction finders. Aero digest, New York, Aug. 1937, v. 31, p. 42. illus.

The Extended feeder Marconi-Adcock direction finder. Marconi review, London, May-Aug. 1937, no. 66, p. 23-30. illus.

Automatic radio compass, by H. Busignies. Nature, London, Apr. 10, 1937, v. 139, p. 642.

T.W.A. rotable loop direction finder. Aero digest, New York, Mar. 1937, v. 30, p. 32. illus.

## RADIO DIRECTION FINDER

Visual radio direction finder, by Alexander Klemin. Scientific american, New York, Feb. 1937, v. 156, p. 107. illus.

Aircraft radio-compass, by E. D. Blodgett and E. T. Dickey. Communication and broadcast engineering, New York, Jan. 1937, v. 4, no. 1, p. 14-16.

New Simon radioguide (model D). Aero digest, New York, Jan. 1937, v. 30, p. 56. illus.

Principe et théorie d'une nouvelle réalisation du radiocompas automatique d'aéronef, par A. B. Damyanovitch. L'Onde électrique, Paris, Jan. 1937, v. 16, no. 181, p. 5-28. illus.

Le Radio-compas et ses applications à la navigation aérienne, par H. Busignies. L'Aérophile, Paris, Nov. 1936, Jan. 1937, v. 44-45, no. 11; 1, p. 256-59; 14-20. diagrs., illus. (Also Electrical communication, New York, Oct. 1936, v. 15, no. 2, p. 157-72) (Abstract Communication and broadcast engineering, New York, Jan. 1937, v. 4, no. 1, p. 10-11, 21, 25)

Radiogoniómetros y radiofaros, por J. L. Noziglia. Boletín de informaciones petroleras, Buenos Aires, Jan. 1937, v. 14, no. 149, p. 145-55.

Aeronautic radio. Washington, U.S. Govt. print. off., 1937. 43 p. diagrs., illus. (Aeronautics bulletin no. 27)

La Navigation aérienne avec un radio compas, par J. L. Houssin. L'Aéronautique, Paris, Dec. 1936, v. 18, no. 211, p. 323-29.

A New visual radio direction finder, by F. W. Dane. Aero digest, New York, Nov. 1936, v. 29, no. 5, p. 48-49. illus. (Abstract Scientific american, New York, Feb. 1937, v. 156, p. 167)

Radiocompass mit electronischem Hefele zeigerapparat. Luftwissen, Berlin, Nov. 1936, v. 3, p. 2. diagrs., illus.

La Radiobussola automatica. L'Ala d'Italia, Milano, Sep. 1936, v. 14, p. 19-20. illus.

RCA radio compass. Aviation, New York, Sep. 1936, v. 35, p. 40-41. illus.

Test of cathode ray direction finder, by C. T. Solt. Aero digest, New York, Sep. 1936, v. 29, no. 3, p. 18-19, 84.

## FLIGHT INSTRUMENTS

Cathode-ray aircraft compass, by S. Ostrolenk. Electronics, New York, Aug. 1936, v. 9, p. 12-15, 45. diagrs., illus.

Cathode-ray direction finder. Communication and broadcast engineering, New York, Aug. 1936, v. 3, no. 8, p. 17-18.

Direction finder; cathode-ray beam course indicator. Aviation, New York, Aug. 1936, v. 35, no. 8, p. 45-46. illus.

New R.C.A. aircraft radio compass, by A. M. Harned. Aero digest, New York, Aug. 1936, v. 22, p. 38, 40. diagrs., illus.

La Réduction de l'erreur nocturne en radiogoniométrie par le collecteur d'onde Adcock, par H. Busignies. Le Génie civil, Paris, July 11, 1936, v. 109, p. 48.

Radio compass; description of apparatus and its operation, by J. P. Gaty. Aviation, New York, May-June 1936, v. 35, p. 24-26; 15-18. diagrs., illus.

Wireless equipment for Empire flying boats. Engineering, London, Apr. 3, 1936, v. 141, no. 3664, p. 380-81. (Also Engineer, London, Apr. 3, 1936, v. 161, no. 4186, p. 362-63)

Déviations radiogoniométriques à bord d'avion, par C. Fromy. L'Onde électrique, Paris, Feb.-Apr. 1936, v. 15, no. 170-72, p. 113-32; 167-81; 245-53. diagrs., illus.

Il Radiogoniometro sui velivoli, di Alfonso Lidonnici. Rivista aeronautica, Roma, Mar. 1936, v. 12, no. 3, p. 319-27. diagrs., illus., tables.

Recent developments in Marconi-Adcock direction finding, by S. B. Smith and G. F. Hatch. Marconi review, London, Jan.-Feb. 1936, v. 58, p. 1-14.

Der Telefunkenzielflugpeiler. Luftwissen, Berlin, Feb. 1936, v. 3, no. 2, p. 40-43.

Western electric radio compass. Aviation, New York, Feb. 1936, v. 35, p. 50. illus.

A Homing device in Canada (Lear direction finder). Flight, London, Jan. 2, 1936, v. 29, no. 1410, p. 20.

Aircraft radio compass, by E. D. Blodgett and E. T. Dickey. Communication and broadcast engineering, New York, Jan. 1936, v. 4, no. 1, p. 14-15.

Polarisation errors in direction finders, by R. A. W. Watt. Wireless engineer, London, Jan. 1936, v. 13, no. 148, p. 3-6.

## RADIO DIRECTION FINDER

Radio compass for aircraft, by C. B. Aiken. Bell laboratories record, New York, Jan. 1936, v. 14, no. 5, p. 165-68.

Radio compass in action. Flight, London, Dec. 19, 1935, v. 28, no. 1400, p. 650.

Radio compass; an appraisal, by J. C. Cone. National aeronautic magazine, Washington, Dec. 1935, p. 20-21.

Streamlined radio-compass. Communications and broadcast engineering, New York, Dec. 1935, v. 2, no. 12, p. 19.

Aircraft radio compass. Electronics, New York, Oct. 1935, v. 8, no. 10, p. 7-10, 29.

Scattering, polarisation errors and accuracy of short wave direction finding, by T. L. Eckersley. Marconi review, London, Mar.-Apr., July-Aug. 1935, no. 53; 55, p. 1-8; 20-30.

Simultaneous transmission of radio beacon signals and voice in trial service at Pittsburgh. Air commerce bulletin, Washington, July 15, 1935, v. 7, no. 1, p. 1-4. diagrs.

Radio compass RC 34 A. Flight, London, June 6, 1935, v. 27, no. 1380, p. 621. illus.

Radio compass. Aeroplane, London, May 8, 1935, v. 48, no. 1250, p. 554. illus.

Kruesi radio compass, by Alexander Klemin. Scientific american, New York, May 1935, v. 152, p. 240-41. illus.

Proposed vacuum-tube type of true direction aircraft instrument, by J. A. Brooks. Instruments, Pittsburgh, May 1935, v. 8, no. 5, p. 116-18. illus.

Simon radioguide for aircraft, by H. W. Roberts. Aero digest, New York, May 1935, v. 26, no. 5, p. 40-41. diagrs., illus.

American radio compass. Flight, London, Apr. 11, 1935, v. 27, no. 1372, p. 400. illus.

Radio compass - what is it? by W. P. Lear. Western flying, Los Angeles, Apr. 1935, p. 13-15.

Modern aircraft radio equipment. Flight, London, Mar. 14, 1935, v. 27, no. 1368, p. 274-76.

Lear radio compass. Aviation, New York, Mar. 1935, v. 34, p. 108-09. diagr.

Lear radio direction finder. Aero digest, New York, Mar. 1935, v. 26, p. 47. diagrs., illus.

## FLIGHT INSTRUMENTS

Excelsior for the sportsman (Lear radio compass). Sportsman pilot, New York, Feb. 15, 1935, p. 28-29.

Kruesi radio compass for commercial use, by F. W. Lutz. Aero digest, New York, Feb. 1935, v. 26, no. 2, p. 50, 75. (Also Aviation, New York, Feb. 1935, v. 34, p. 72-73)

Radio compass for itinerant pilots, by Alexander Klemin. Scientific american, New York, Feb. 1935, v. 152, p. 93-94.

Radio compass to guide airmen through cloud and fog. Aero digest, New York, Jan. 1935, v. 6, no. 1, p. 50.

Automatischer bordpeiler. Interavia, Geneva, 1935, no. 217, p. 4.

The Kruesi radio compass. Woodside, New York, Fairchild aerial camera corporation, 1935. 14 p. diagrs., illus.

Zielfluggerät Telefunken, von O. Nairz. Telefunken zeitung, Berlin, 1935, v. 16, no. 70, p. 43-51. illus.

Zielflugpeiler. Interavia, Geneva, 1935, no. 234, p. 4.

Experimentelle untersuchungen über den beim funkpeilen störenden nachteffekt, von G. Borkowitz. Hochfrequenztechnik und elektroakustik, Frankfurt, Nov.-Dec. 1934, v. 44, no. 5-6, p. 174-78; 181-85.

Simon radio range and direction finder. Aeroplane, London, Nov. 7, 1934, v. 47, no. 1224, p. 552-53.

Radio compass developed by Westport manufacturing company. Aero digest, New York, Nov. 1934, v. 25, p. 38. illus.

À propos du radio-compas de l'army air corps et du dispositif de pilotage automatique Sperry utilisé par Wiley Post. Revue des forces aériennes, Paris, Dec. 1933. 6 p. diagrs.

Radio direction finder for use on aircraft, by Wilbur S. Hinman, Jr. Bureau of standards journal of research, Washington, Dec. 1933, v. 11, no. 6, p. 733-41. diagrs., illus. (Abstract Proceedings of the Institute of radio engineers, New York, Jan. 1934, v. 22, no. 1, p. 117-18)

The Marconi homing device. Flight, London, Nov. 30, 1933, v. 25, no. 1301, p. 1205.

Music with your navigation, by L. R. Hubbard. Sportsman pilot, New York, Nov. 1933, v. 10, no. 5, p. 16-17, 46-47.

## RADIO DIRECTION FINDER

Radio direction finder for use on airplanes. Electrical engineering, New York, Nov. 1933, v. 52, no. 11, p. 779-80.

Erreurs dans la détermination de la courbe d'erreurs quadrantales d'un radiogoniomètre de bord dues à la forme de l'antenne d'émission, par E. Bellini. Bulletin de la Société française des électriciens, Paris, Sep. 1933, v. 3, no. 3, p. 882-84.

Radio compass developed in H. M. Signal school, by C. E. Horton and C. Crampton. Journal of the Institution of electrical engineers, London, Sep. 1933, v. 73, no. 441, p. 284-94. diagrs.

La Radio nei collegamenti e nella guida delle rotte aeree, di G. Manisco. Rivista aeronautica, Roma, Sep. 1933, v. 9, p. 433-74.

The Marconi-Robinson "Homing" device. Aeroplane, London, Aug. 23, 1933, v. 45, no. 8, p. 356. illus.

Radio direction finder of simplified type for use on airplanes. Air commerce bulletin, Washington, Aug. 1933, v. 5, p. 31-33. diagrs.

Directional wireless telegraphy in aircraft, by C. K. Chandler. Journal of the Institution of electrical engineers, London, July 1933, v. 61, no. 320, p. 803-11. illus.

Third report of liason committee on aeronautic radio research. Air commerce bulletin, Washington, May 15, 1933, v. 4, p. 555-59.

Wireless direction finding; Marconi-Adcock aerial system. Electrical review, London, Apr. 28, 1933, v. 112, p. 594. illus. (Also Electrician, London, Apr. 21, 1933, v. 110, p. 513)

La Signalisation optique et hertzienne dans l'aéronautique, par E. Marcotte. Arts et métiers, Paris, Apr. 1933, no. 151, p. 124-29.

La Radiogoniométrie et les radiocompas stroboscopiques, par René Hardy. Revue générale de l'électricité, Paris, Jan. 21, 1933, v. 33, no. 3, p. 85-94. diagrs., illus.

The Cause and elimination of night effects in radio range-beacon reception, by Harry Diamond. Bureau of standards journal of research, Washington, Jan. 1933, v. 10, no. 1, p. 7-34. charts, diagrs., illus., tables.

## FLIGHT INSTRUMENTS

Un Nouveau radiocompas stroboscopique pour la navigation sans visibilité, par René Hardy. L'Aéronautique, Paris, Oct. 1932, no. 161, p. 309-15. (Abstract Journal of the R.A.S., London, Sep. 1933, p. 817)

Radiocompas stroboscopique à lecture directe, par René Hardy et Bertrand-Lepante. C. R. Acad. sci., Paris, Sep. 5, 1932, v. 195, no. 10, p. 518-21.

Note on theory of night errors in Adcock direction-finding systems, by J. F. Coales. Journal of the Institution of electrical engineers, London, Sep. 1932, v. 71, n o. 429, p. 497-506.

Airplane receiving equipment for visual radio range-beacons. Journal of the Franklin institute, Philadelphia, May 1932, v. 213, p. 568-70.

Airplane radio direction finder. Air commerce bulletin, Washington, Mar. 15, 1932, v. 3, p. 433-38. illus.

Wireless and night flying. Flight, London, Feb. 19, 1932, v. 24, no. 8, p. 154-55. illus.

Theory of design and calibration of vibrating-reed indicators for radio range beacons, by G. L. Davies. Proceedings of the Institute of radio engineers, New York, Jan. 1932, v. 20, no. 1, p. 478-515. (Also Bureau of standards journal of research, Washington, July 1931, v. 7, no. 1, p. 195-213)

Le Deviazioni radiogoniametriche a bordo, di F. Vicedomini. Livorno, Regia accademia navale, 1932. 8 p. (Pubblicazione no. 70)

La Radiogoniométrie, par H. Busignies. (In Comptes rendus du Congrès international de l'électricité, Paris, 1932, v. 11, sec. 9, p. 386-95)

La Radiogoniométrie, par R. Mesny. (In Comptes rendus du Congrès international de l'électricité, Paris, 1932, v. 11, sec. 9, p. 373-85. bibliog.)

A Course indicator of pointer type for the visual radio range-beacon system, by Francis Winkley Dunmore. Proceedings of the Institute of radio engineers, New York, Sep. 1931, v. 19, no. 9, p. 1579-1605. (Also Bureau of standards journal of research, Washington, July 1931, v. 7, no. 1, p. 147-70)

Procédés de radioalignement, par P. Besson. L'Onde, électrique, Paris, Sep. 1931, v. 10, no. 117, p. 369-416. illus.

Repérage de directions fixés au moyen d'ondes hertziennes radio-alignements, par J. Aicardi. Bulletin de la Société des ingénieurs civils de France, Paris, Sep. 1931, v. 84, p. 1405-14.

Aeronautic radio research (Radio direction finder). Air commerce bulletin, Washington, July 15, 1931, v. 3, no. 2, p. 37.

Air corps studies direction finders. Aero digest, New York, May 1931, v. 18, no. 5, p. 98.

Pointer type course indicator for use with visual-type radio range-beacon development. Air commerce bulletin, Washington, Apr. 15, 1931, p. 526-29.

Way home, by G. R. Fisher. Western flying, Los Angeles, Mar. 1931, v. 9, no. 3, p. 26-28. illus.

Un Nouveau radiocompas, par H. Busignies. L'Onde électrique, Paris, Sep. 1930, v. 9, p. 397-415. illus.

Peiltürme im dienste des luftfahrtwesens, von R. Schulz. Die Luftwacht, Berlin, Sep. 1930. 8 p. diagrs., illus.

Recent developments in direction finding apparatus, by R. H. Barfield. Journal of the Institution of electrical engineers, London, Aug. 1930, v. 68, p. 1052-75. diagrs.

A Tuned-reed course indicator for the four-and twelve-course aircraft radio range, by Francis Winkley Dunmore. Proceedings of the Institute of radio engineers, New York, June 1930, v. 18, no. 6, p. 963-82. diagrs., illus., plates. (Also Bureau of standards journal of research, Washington, Apr. 1930, v. 4, no. 4, p. 461-74)

Airplane direction finders. Journal of the Franklin institute, Philadelphia, May 1930, v. 209, p. 684-85. (Also Radio service bulletin, Washington, Mar. 1930, v. 156, p. 24-25)

Consolidated radio-beacon tuned reed. Airway age, East Stroudsburg, Pa., Dec. 1929, v. 10, no. 12, p. 1992. illus.

Course-shift indicator for double modulation type radio-beacons, by Harry Diamond and Francis Winkley Dunmore. Aero digest, New York, Dec. 1929, v. 15, no. 6, p. 168-70. (Also Bureau of standards journal of research, Washington, July 1929, v. 3, no. 1, p. 1-10)

The Radio-beacon tuned reed indicator. Aviation engineering, New York, Nov. 1929, v. 2, no. 11, p. 39. illus.

## FLIGHT INSTRUMENTS

Radio-beacon indicator. Aero digest, New York, Nov. 1929, v. 15, no. 5, p. 160. illus.

Radio device prevents airplane detours, by J. E. Smith. Aviation engineering, New York, Sep. 1929, v. 2, no. 9, p. 19-21.

Uber fehlweisungen bei der funkpeilung, von P. Duckert. Zeitschrift für hochfrequenztechnik, Frankfurt, Aug. 1929, v. 34, no. 2, p. 60-65. illus.

Der Bordpeilempfaenger im flugzeug, von H. Glöckner. Zeitschrift für hochfrequenztechnik, Frankfurt, Mar.-Apr. 1929, v. 33, no. 3-4, p. 92-101; 132-38. illus. (Also Jahrbuch 1929 der D.V.L., München, p. 233-44)

Direkt-zeigendes funkentelegraphisches peilverfahren, von R. Hell. Zeitschrift für hochfrequenztechnik, Frankfurt, Apr. 1929, v. 33, no. 4, p. 138-45.

Inventor of radio compass tells how it was developed, by F. A. Kolster. Universal engineer, New York, Apr. 1929, v. 49, no. 4, p. 31-32. illus.

Design of tuned reed course indicators for aircraft radio-beacon, by Francis Winkley Dunmore. Bureau of standards journal of research, Washington, Nov. 1928, v. 5, no. 5, p. 751-69. illus. (Abstract Airway age, New York, Jan. 1929, v. 10, p. 56)

Radio direction finder, by R. L. Smith-Rose. Wireless world, London, Aug. 15, 29, 1928, v. 23, no. 7, 9, p. 186-88; 247-51. illus.

Radio progress, by S. R. Winters. Popular aviation, Chicago, July 1928, v. 3, no. 1, p. 36-38. illus.

Le Radio-compas et la navigation aérienne. L'Industrie électrique, Paris, June 25, 1928, v. 37, no. 864, p. 284-86.

Radio direction finder. Popular aviation, Chicago, May 1928, v. 2, no. 5, p. 27, 92. illus.

Appareils indicateurs donnant par lecture directe la direction d'une onde, par H. Busignies. L'Onde électrique, Paris, 1927, v. 6, p. 277-303.

A Direct-reading radio compass, by W. A. Steel. Electrical news, Toronto, Aug. 1, 1926, v. 35, no. 15, p. 37-39. illus.

# RADIO DIRECTION FINDER

The Cause and elimination of night errors in radio direction-finding, by R. L. Smith-Rose and R. H. Barfield. Journal of the Institution of electrical engineers, London, Aug. 1926, v. 64, no. 356, p. 831-43. illus.

An Instantaneous direct-reading radio-goniometer, by R.A.W. Watt and J.F. Herd. Journal of the institution of electrical engineers, London, May 1926, v. 64, p. 611-22. diagrs. (Also Wireless world, London, Mar. 1926, v. 18, p. 367-69)

A Unicontrol high-frequency radio direction finder, by Francis Winkley Dunmore. Bureau of standards scientific papers, Washington, Apr. 16, 1926, no. 525, p. 23-35. illus.

Beam direction finding. Electrician, London, Sep. 11, 1925, v. 95, no. 2469, p. 296-97. illus. (Also Electrical review, London, Sep. 11, 1925, v. 97, no. 2494, p. 411-12)

The Effect of the shape of the transmitting aerial upon observed bearings on a radio direction-finder, by R. L. Smith-Rose. Journal of the Institution of electrical engineers, London, Nov. 1924, v. 62, no. 335, p. 957-63. diagrs., tables.

Position from radio-compass bearings, by G. W. Littlehales. U.S. Air service, Washington, Aug. 1924, v. 9, no. 8, p. 28.

Wireless navigation, by J. Robinson. Journal of the Royal society of arts, London, June 20, 1924, v. 72, no. 3735, p. 516-31. illus.

Mesures radiogoniométriques en avion, par P. Franck. L'Onde électrique, Paris, Feb. 1924, v. 3, p.65.

Directional wireless telegraphy in aircraft, by C. K. Chandler. Journal of the Institution of electrical engineers, London, July 1923, v. 61, p. 803-11. diagrs.

The Effect of local conditions on radio direction finding installations, by R. L. Smith-Rose and R. H. Barfield. Journal of the Institution of electrical engineers, London, Jan. 1923, v. 61, no. 314, p. 179-91. (Abstract Scientific american, New York, Apr. 1923, v. 128, p. 237)

Radiopejling, av Siffer Lemoine. Teknisk tidskrift, Stockholm, July 29, Aug. 19, 1922, v. 52, no. 30, 33, p. 481-84; 529-33. illus.

Draadlooze orienteering van vliegtuigen, door A. Sluiters. Het Vliegveld, Amsterdam, July 1922, v. 6, no. 7, p. 158-59.

## FLIGHT INSTRUMENTS

Aeroplanes and radiogoniometers, by A. Perry. Radio news, New York, Apr. 1922, v. 2, p. 683.

The Essentials of the radio compass, by J. E. Williams. U.S. Naval institute proceedings, Menasha, Wis., Feb. 1922, v. 48, no. 228, p. 203-15. illus.

Errors of direction finders, by E. Bellini. Scientific american, New York, May 1921, v. 3, p. 451-53. (Also Electrician, London, Feb. 18, 1921, v. 86, p. 220-22)

Radio compass. Scientific american, New York, Jan. 15, 1921, v. 124, p. 43.

Report on semiportable radio direction finder - type SCR-142. Washington, U.S. Govt. print. off., 1921. illus. (U.S. Air service information circular no. 238)

Directional wireless. Aeronautics, New York, Dec. 9, 1920, v. 19, p. 417.

Radio compass for directing airplanes to ships. Scientific american, New York, Nov. 6, 1920, v. 73, p. 465.

Experiments on wireless direction finding on aircraft, by R. Baldus and Eberhard Buchwald. Radio review, London, Nov. 1920, v. 1, p. 724. (Also Science abstracts, London, Aug. 31, 1920, section B, no. 766 and Jahrbuch der drahtlosen telegraphie und telephonie, Frankfurt, Mar. 1920, v. 15, p. 214)

Radio compass and automatic pilot developed for naval flying-boats, by Jenkins B. Kean. Popular mechanics, Chicago, Oct. 7, 1920, v. 34, p. 485-87. diagrs., illus.

Radio compass or direction-finder systems, by R. E. Thompson. Far east review, Shanghai, Sep. 1920, v. 16, no. 9, p. 499. illus.

Theory and practical attainments in the design and use of radio-direction finding apparatus using closed coil antennas, by A. S. Blatterman. Journal of the Franklin institute, Philadelphia, Pa., Sep. 1920, v. 188, 190, p. 289-362, 425. illus.

Radio compass successful. Aircraft journal, London, Aug. 30, 1920, v. 7, p. 12.

Absolute direction finding with a loop aerial. Wireless world, London, Aug. 7, 1920, v. 8, no. 10, p. 350-51. illus.

Direction finding in relation to aircraft. Aeroplane, London, Apr. 7, 1920, v. 18, no. 14, p. 728, 730.

## RADIO DIRECTION FINDER

Funkentelegraphische ortsbestimmung für luftfahrzeuge, von M. Dieckmann. Luftfahrt, Berlin, Apr. 1, 1920, v. 24, no. 4, p. 57-59. illus. (*Abstract* Radio review, London, Feb. 1921, v. 2, p. 109)

Radiogoniomètres de bord. Bulletin technique du Bureau véritas, Paris, Dec. 1919, v. 1, no. 7, p. 114-18. diagrs.

Kolster's direction finder. Wireless age, London, Nov. 1919, v. 7, no. 2, p. 24-25. illus.

Wireless direction finders, by H. Riall Sankey. Engineering, London, Oct. 17-24, 1919, v. 108, no. 2807-2808, p. 523-24; 545-47. illus. (*Also* Engineer, London, Oct. 17, 1919, v. 128, p. 388-91)

Loop of wire; an interesting radio communication development, by W. J. Henry. Scientific american, New York, Oct. 11, 1919, v. 121, p. 368. illus.

Directional wireless with special reference to aircraft, by James Robinson. Radio review, London, Oct. 1919, v. 1, no. 1, p. 39-42.

Wireless navigation for aircraft. Aeronautics, London, Sep. 25, 1919, v. 17, no. 310, p. 301.

Wireless compass, by J. Lachenbruch. Review of reviews, New York, June 1919, v. 59, p. 654-55. (*Also* Scientific american, New York, Mar. 22, 1919, v. 120, p. 291)

Radio direction-finder apparatus, by A. S. Blatterman. Electrical world, New York, Mar. 8, 1919, v. 73, p. 464-67. diagrs., illus.

## GENERAL

Étalonnage en vol des instruments de bord, par LeRoy. Revue du ministère de l'air, Paris, Mar. 15, 1936, v. 2, no. 15, p. 341-47. diagrs.

Development of flying instruments, by F. W. Haig. Aircraft, Melbourne, Feb. 1, 1935, v. 13, no. 5, p. 8-9, 38. illus.

The Care of instruments, by Clarence H. Brainerd and John L. Keays. Western flying, Los Angeles, Cal., Dec. 1934, v. 14, no. 12, p. 11-13, 22-23. illus.

## FLIGHT INSTRUMENTS

Les Instruments de navigation pour les tourists aviateurs, par H. de Graffigny. L'Aérophile, Paris, Oct. 1933, v. 41, no. 10, p. 304-06. illus.

Know your way around, by L. D. Webb. U.S. Air services, Washington, Sep. 1931, v. 16, no. 9, p. 11-14. illus.

Servicing aircraft instruments, by George Tate, Jr. Aviation, New York, Apr. 1931, v. 30, no. 40, p. 239-43. illus.

Instrument maintenance, by James P. Wines. Airway age, New York, Mar. 1931, v. 12, no. 3, p. 232-35. illus.

Design of aircraft instruments, by C. J. Stewart. Aircraft engineering, London, July 1930, v. 2, p. 173-76. diagrs., illus.

Installing and servicing aircraft instruments, by J. D. Peace. Transactions of the A.S.M.E., New York, July-Sep. 1929, v. 1, no. 3, p. 167-68.

Instrument installation, by F. K. Gundlach. Aviation engineering, New York, Aug. 1929, v. 2, no. 8, p. 22-23.

Why instruments seem to fail in fog, by William C. Ocker. Aeronautic review, Washington, Nov. 1928, v. 6, no. 11, p. 174. illus.

Prevention of corrosion in instruments, by William Nelson. Aviation, New York, Oct. 20, 1928, v. 25, no. 17, p. 1260, 1276, 1278. illus.

Quelques instruments nouveaux. L'Aérophile, Paris, Sep. 1-15, 1928, v. 36, no. 17-18, p. 283. illus.

Aircraft instruments, by Theodore C. Lonnquest. Aviation, New York, July 9, 1928, v. 25, no. 2, p. 107, 129-34. illus. (Also U.S. Naval institute proceedings, Menasha, Wis., May 1928, v. 54, no. 303, p. 405-11)

Modern developments in aircraft instruments, by C. J. Stewart. Journal of the R.A.S., London, June 1928, v. 32, no. 210, p. 425-81.

Airplane instruments. Popular aviation, Chicago, Dec. 1927, v. 1, no. 5, p. 43-44, 64. illus.

Aircraft instruments for oversea navigation, by Victor E. Carbonara. S.A.E. journal, New York, Nov. 1927, v. 21, no. 5, p. 528-31. illus.

Les Instruments de contrôle pour la locomotion aérienne. L'Aérophile, Paris, Dec. 1-15, 1924, v. 32, no. 23-24, p. 391. illus.

## GENERAL

Some recent developments in aircraft instruments, by H. E. Wimperis. Journal of the R.A.S., London, Jan.-Feb. 1924, v. 28, no. 157-158, p. 3-34; 45-48. illus.

Flugzeug-steuerzeiger, von A. Neuburger. Verkehrstechnik, Charlottenburg, Feb. 5, 1920, no. 4, p. 51-53. illus.

Navigation instruments. Aeronautics, London, Dec. 11, 1919, v. 17, no. 321, p. 527. illus. (Also Aeroplane, London, Dec. 10, 1919, v. 17, no. 24, p. 1928)

Navigating instruments of our aerial pilots. Scientific american, New York, Aug. 17, 1918, v. 119, p. 141-42.

Aeronautic navigating instruments. S.A.E. journal, New York, May 1918, v. 2, no. 5, p. 380-81.

## AUTHOR INDEX

Ageton, Arthur Ainsley 3,25
Ahlborn, F. 132
Aicardi, J. 141
Aiken, C. B. 137
Alexanderson, E. F. W. 65,78
 80,81
Allen, E. T. 40
Allen, James R.1,23,34,46,62
 63,72,82,105,109,120
Andrews, Frederick S. 39
Ange, R. 82
Ault, J. P. 18,28,41
Aussenac, L. 114,126
Aviles, Joaquin 13
Avronsart, Armand 78
Aymat, José Maria 3
Aymerito, P. 72
Backer, J. W. F. 97
Badin, R. E. 131
Bailey, A. 66,74
Baker, T. Y. 22,29
Baldus, R. 144
Barbaud, A. 28
Barbieri, Fortunato 4
Bardot, F. 47
Barfield, R. H. 134,141,143
Barlow, F. R. 42
Barnaby, Ralph S. 39
Baron, A. 120
Bassett, Preston R. 91,92,95
 96,97
Bastide, A. 13
Bastien, A. 11
Batty, W. 125
Bauarten, D. F. S. 103
Bauer, Charles J. 91
Bauer, Louis A. 111
Becker, H. I. 48
Becker, L. 21
Beghin, H. 115
Behm, A. 66,81
Beij, K. Hilding 6,18,21,63
 65,83,100,105,113,117,118
 121,127,128
Bellini, E. 139,144
Bellini, H. 45
Bellini, V. 105
Bellot, A. 51
Bennett, D.C.T. 1,12,20,23,33
 44,61,123
Bennewitz, Kurt 66,67,101,102
 129
Benson, Charles Beverley 8
Bentley, William C. 11,33
Berget, Alphonse 87
Berroth, A. 79
Berry, A. W. 25
Bertin, Ch. 6,7,49,57
Bertram, Otto 9
Bertrand-Lepante 140
Besson, P. 49,50,140
Bestelmeyer, A. 42
Bidlingmaier, 42
Bigelow, P. W. 93
Biondi, Luigi 5
Biseo, Attilio 15,26
Blackburne, H. S. 2
Blakely, J. H. 75
Blatterman, A. S. 144,145
Blee, Harry Harmon 34
Blodgett, E. D. 135,136
Blondel, A. 49
Bodde, F. 94
Boel, Maurice 108,130
Boland, Frank E. 77
Bonnalie, A. F. 45
Booth, Harris 77
Borkowitz, G. 138
Bortels, Adolf 8
Bosanquet, H. T. A. 8
Bouck, Z. 49
Boutet, P. 46
Boutillier, 24
Bowditch, Nathaniel 7,19,29
Bowman, L. H. 47
Boykow, H. 5,18,40,41,96,110
Brainerd, Clarence H. 145
Briggs, Lyman J. 114
Brion, Maurice 27,29
Brombacher, William G. 21,61
 63,65,66,82,83,84,86,90,100
 103,105,106,113,114,117,118
 121,127,128
Brooks, J. A. 137
Brown, Sidney G. 100,115
Brown, W. G. 112
Brunat, M. 131
Buchwald, Eberhard 144
Buckingham, C. T. 66
Buckingham, E. 69,77
Busignies, H. 44,45,134,135
 136,140,141,142
Byasson, L. 126
Byrd, Richard E. 59
Cabrini, A. 55
Cahill, B. J. S. 37
Cailletet, Louis P. 87
Campbell, G. R. C. 8
Canac, François 49
Capon, R. S. 68,111

Carbonara, Victor E. 21,112
118,127,146
Card, S. F. 7
Cárdenas, Santiago 14
Cardona, Pedro 13,24
Carr, C. B. 50
Caspari, E. 89
Ceccotti, Giuseppe 14
Chalmers, Thomas W. 115
Chandler, C. K. 55,139,143
Chichester, Francis 25
Christie, M. G. 41
Ciamberlini, U. 65
Clahoun, Guy K. 83
Clapham,Charles B. 74,85,132
Clark, M. E. 98
Clarke, N. R. 120
Claudy, C. H. 98,111
Clephane, Douglas W. 36
Clift, Eric H. 42,119,125
Coales, J. F. 140
Coburn, Jr. James M. 33,43
Coffin, J. G. 104
Coffin, John H. C. 7,19
Cohen, J. 61,71
Colberg, H. 134
Coldewey, H. 12,117
Coleman, Donald G. 65,74
Collin, Fernand 55
Collins, Elmer B. 57
Colt, G. H. 87
Colvin, Charles H. 72,88,99
100,102,103,105,113
Colwell, R. C. 97
Comstock, George Cary 7,19
Cone, J. C. 137
Connor, Harry P. 125
Constantin, Louis 29
Cook, W. H. 108
Cooke, P. A. 90
Cordeiro, F.J.B. 22
Cordero, F. 65,83
Cornet, C. 5
Coutinho, Gago 17,28
Cox, J. F. 34
Crampton, C. 139
Crotti, Attilio 48
Crouse, G. B. 115
Cutrell, E. A. 46
d'Autheville, F. 2
de Aquino, Radler12,18,28,37
de Castilho, Jorge 17,28
de Fonvielle, Wilfrid 87
de Graffigny, H. 146
de Guiche,A. de Gramont 74
De Wet, J. P. 46
Dagnaux, J. 27
Daillière 13
Daloz, G. 126
Dalton, Philip 30,31,82
Damyanovitch, A. B. 135
Dane, F. W. 135
Danielson, O. A. 76
Danielzig, Helmut 61,71,105
Dapsence, P. 93
Darwin,Horace 77,102,107,125
David, P. 51
Davies, G. L. 140
Davies, L. Graham 42
Daviot, L. 12
Davis, John E. 7,37
Davis, P. L. H. 7,9,37,38
Deimel, R. F. 96
Dellinger, J. H. 53,54
Delsasso, L. P. 79
Delsuc, Jean 11,23,91,108,114
116,130
Denman, R. 44,46
Dévé, Max 110
Diamond, Harry 51,63,139,141
Dickey, E. T. 135,136
Dieckmann, M. 145
Dixie, Albert E. 8
Dobson, G.M.B. 22,101,124
Draper, C. S. 61,78,108
Dreisonstok, Joseph Young 2
25,34
Driencourt, L. 45
Driscoll, Marjorie 52
Duckert, P. 142
Dudley, A. M. 116
Dulton, Benjamin 2
Dumbleton, J. E. 1,7
Duncan, A. 39
Duncan, Richard 4
Dunmore, Francis Winkley 6,47
55,57,67,140,141,142,143
Dunoyer, L. 29
Dupuy, P. 35
Duval, A. B. 5,32,39,56
Eaton, Herbert Nelson 6,18,21
28,56,65,66,67,75,113,118,
121
Ebert, O. 40
Eckersley, T. L. 46,137
Edelstein, Fritz 41
Edgerton, James C. 57
Elia, Luigi 105
Elm, Ienar Ewald 4,27
Ende, W. 116

Engel, F. H. 6,55,67
Erskine-Murray, J. 56
Escande, L. 73
Eshbaugh, J. E. 66,74
Étévé, A. 94,95
Everitt, P. F. 15
Everling, E. 5,65,66,100,129
Failer, Hans 44
Fairlamb, Jr. George R. 16,17 27,36,52,110
Favé, L. 37
Fereday, R. A. 134
Ferguson, George William , **1 13,34,39**
Ferry, E. S. 94
Fiamberti, A. 91
Field, M. B. 119
Fieux, E. J. 96
Filson, L. N. G. 29,85
Finch, V. C. 72
Fink, D. 133
Fisher, Gerhard R. 49,141
Fitz, J. A. 94,95
Florisson, Charles 80
Förstner, Gustav 21
Foges, Georg 79
Forni, G. 34
Franck, P. 45,53,55,82,89,90 115,143
Franklin, W. S. 101,118,129
Freeman,Jr.,J.R. 86,103,106
French, Edward F. 54
Fressanges, F. J. 11
Friedensburg, Walter 122
Fromy, E. 45,49,136
Frotscher, W. 45
Furnival, J. M. 45
Fuss, H. 21
Gagelmann, Friedrich W.T. 8
Galante, N. 14,35,37,41,46
Galmard, R. 35
Gansberg, Fritz 9,41
Gardner, G.W.H. 20,71,78,88 121
Gardner, J. M. 11
Garin, L. 28
Garratt, G.R.M. 91,92,93
Gates, S. B. 61,71
Gatty, Harold C. 14,24,110
Gaty, J. 136
Gaujour, Robert 62,108
Geckeler, J. W. 114
Gehlhoff, Georg 125
Gemelli, Agostino 24
Geppert, John W. 14
Gerhardt, W. F. 67,103
Gier, J. H. 117
Gill, T. H. 53
Gingrich, John E. 3,14
Giulietti, G. 112,121
Givelet, 48
Glauert, H. 24
Gloeckner, Heinrich 3,50,52 116,142
Goldsborough, Brice 113
Gonzalez, Carlos 30
Goubat, Raul 41
Gradenwitz, Alfred 89,92,96 122
Graff, K. 9
Grasso, R. 33,35
Gray, A. 98
Gray, J. G. 98
Green, C. F. 48,80
Greenhill, George 99,111
Grenier, P. 32
Griffiths,Edgar A.101,106,122
Griselin, L. 121
Grötsch, Rudolf 1,46
Gundlach, F. K. 146
Gunn, R. 53,116
Gustosa, Corrado 31,94,114
Guyot, Jean 13,50,79
Gymnich, Alfried 16,27,53
Hagen, A. 47
Hagio, N. 78
Hagiwara, Ikutaro 84
Haig, F. W. 145
Hammond, William C. 59
Hanson, Earl C. 58
Hardy, René 139,140
Harmsen, K. 8,18,29
Harned, A. M. 136
Harrison, D. W. 91
Hartmann 22
Hartog, Jules 108,130
Hatch, J. F. 45,133,136
Hattori, Kunio 84
Hauptmann, Friedrich 122
Haus, F. 91
Hawks, Frank 31
Hébrard, L. 5
Hecht, N.F.S. 53
Heck, N. H. 109
Heer, O. 43,133
Hegenberger,A.F. 17,27,53,59
Heintz, R. M. 52
Hell, Rudolf 52,142
Hellwig 131
Hémardinquer, P. 54

Hendrickson, H.B. 86,103,106
Henney 43
Henry, W. J. 145
Herbert, Percy 5
Herd, J. F. 143
Herschel, W. H. 69,76
Hersey, M.D.67,75,86,104,106
Heyl, Paul R. 114
Hicks, J. J. 87
Hill, E. L. 96,115
Hill, P. W. 92
Hilton, W. F. 62,71
Hingsburg, F. C. 52,59
Hinkel, Jr. Hulbert 12
Hinman, Jr. Wilbur S. 138
Hirschauer, L. 29
Hobbs, I. E. 23
Hofmann, A. 127,131
Hohmann, W. 93
Holland, Harvey Hodges 3,15
26,31,35,40,50,64,109
Hoover, Jr. Herbert 51,52
Hopkins, H. G. 43
Hoppe, F. 88
Hormel, W. 20
Hornung, J. L. 46
Hort, Wilhelm 98
Horton, C. E. 139
Hosmer, E. A. 53
Houseman, M. R. 64
Houssin, J. L. 44,135
Hubbard, L. R. 138
Hugel, G. 78
Huggins, Marion 96
Hughes, A. J. 20
Hulbert, A. W. 75,85
Hull, T. G. 86
Hunt, Franklin L. 21,66,67
75,84,100,105,113,127,129
Huntington, Hubert S. 33
Hyland, Lawrence A. 53,81,83
Ide, John Jay 49,99
Immler, Werner 1,5,8,12,16
23,69,108,109,125
Inozemtzev, A. 3
Irvin, George E. 91
Irwin, J. R. 51,54
Itaya, M. 71
Jackson, W. E. 51
Jacques, P. 54
Jameson, Richard P. 86
Jeffrey, Douglas G. 16,27,36
40,51,52,107,112,115,122
Johansen, F. C. 66,74
Johnson, Daniel P. 61
Jones, Bradley 3,15,17,26,27
35,50,53,59,64,83,123,124,
133
Jones, R. 69
Joux, E. J. F. 7
Judge,Arthur William 7,68,76
124,130
Kahle, Keith H. 94
Kalitin, N. 69,111
Karpinski, A. 83
Kaull, B. von 92
Kean, J. B. 98,144
Kear, Frank Gregg 51
Keays, John L. 145
Keen, Ronald H. 5,54,58
Kennedy, Mel S. 35
Keulegan, G. H. 64
Kiel, G. 72
King, H. 47
Kissam, P. 108
Klein-Schoenbeck 109
Klemin, Alexander 71,78,80,82
88,90,92,93,95,100,126,132
135,137,138
Knight, W. 58
Kobbe, L. von 22
Kohlschütter, Arnold 9,20,38
Kolster, F. A. 6,57,142
Koppe, H. 5,65,66,84
Koschmieder, K. 133
Krebs, Wilhelm 111
Kritzinger, H. H. 125
Kruttschnitt, J. 34
Kumbruch, H. 66,74
Kunze, W. 79
La Polla, Ernesto 7
La Porte, F. 47
Le Petit, R. 28
Le Prieur, Ives 5,32,60
Le Roy 145
Lacaine, J. 92
Lachenbruch, J. 145
Lacmann, Otto 25
Ladd, Story B. 37
Lainé, André 28
Lallemande, Charles 38
Lawton, E. J. 109
Lear, W. P. 137
Lee, A. 68,111
Lees, George F. 56
Lefranc, J. A. 132
Léglise, Pierre 79,94,114
Leib, August 5,55

Leick, Walter 9,20
Lemoine, Siffer 143
Leonard, Royal 13
Lesage, A. 32,103
Lescure, H. 90
Leva, F. M. 95
Levi-Civita, Tulio 25
Lewis, William L. 131
Lidonnici, Alfonso 45,136
Lieck, Franz 8
Lienesch, C. F. 40
Lindell, J. H. 24
Lindemann, F. A. 69,102,111
Lindholm, F. 84
Lindt, W. 22
List, H. 129
Littlehales,G.W. 19,38,58,143
Lock, C. N. H. 62,71
Long, Sidney Herbert 5,54
Lonnquest,Theodore C. 84,100
117,146
Loth, William 28,51,52,57
Lucas, Keith 111,119
Luckey, George P. 21,74,85
101,113,118,129
Lundberg, B. 23
Lutz, F. W. 138
Lyon, Thoburn C. 1,2,33,34
MacMillan, Norman 14,24,34
MacNair, Walter A. 67,75
McDonald, J. A. 48
McGillivray, J. A. 108
McKay, Walter 108,116
McLean Connor, H. P. 59
McMullen, John Alexander 3,24
McMullin, C. R. 59,112
McReynolds, Charles F. 83
Macholz, Gustav E. 119
Magee, H. W. 90,114
Magyar, Alexander 14
Malgorn, G. 54,115
Mallock, A. 111
Manisco, G. 48,139
Marchand, H. 58
Marcotte, E. 139
Marcuse, Adolfo 16,42
Marmonier, L. 63
Marriott,Robert H. 57,80,112
Martin, C.W. 1,22,33,61,107
116,123
Martin, L. 30
Mathieu, M. 94
Matsuo, S. 77,78
Matthias, Joachim 92
Maurer, H. 52,110,120
Mazzaron, A. G. 26
Mears, A. H. 86,103,106
Meissner, Walther 67,85
Meldau, H. 124
Memmo, Dino 81
Menez 7
Meredith, F. W. 90
Merino, Manuel Martínez 109
Merriam, Kenneth G. 62,72
Mesny, M. 49,56
Mesny, R. 140
Mieden van Opmeer,
J.P.F. van der 110
Miller, J. E. 48
Miller, O. M. 34
Mioche, R. 97
Mises, R. von 25
Mitereff, S.D. 91
Möller, W. 122
Moffert, Pierre 29
Molchanov, P. A. 6,60,66
Monfraix, M. 114,115
Monk, Frank V. 2,13,24,39,47
Montecino, Carlos 15
Moritz, A.J.L. 124
Morris, F. D. 91
Morrison, I. F. 97
Muhleman, M. L. 81
Musella, Francesco 49
Nairz, O. 6,18,41,56,138
Neely, F. R. 89
Nelson, Arthur Reinhold 46
Nelson, Frederick, J. 82
Nelson, William 146
Neuburger, A. 147
Neumayer, G. 14,34
Newell, F. B. 85
Newkirk, B. L. 98
Nichols, R. G. 43,134
Niemann, Wilhelm 12
Nitzsche, Martin 5,55
Norton, F. H. 75
Nozdrovski, S. 60
Noziglia, J. L. 135
Nutt, A. E. W.. 71
Ocker, William C. 146
Oddey, F. 52
Oddone, E. 103
Olivares, Paul 105
Olivier, J. S. C. 19,29,57
Oppelt, Winfried 23,105
Ostrolenk, S. 136
Ower, E. 66,74
Ozouf, René 120
Pacher, W.. 110

Pannell, J. R. 69
Parker, B. 47
Parker, R. C. 21
Parsons, John F. 62,72
Passoth, Oskar 132
Patterson, W. A. 89
Peace, J. D. 83,100,132,146
Peltier, H. 87
Pepper, Perry A. 90
Percheron, Maurice 6,8,57
Perlewitz, P. 18,23,28,54
Perrin, F. 44
Perry, A. 144
Pesamosca, A. 50
Pesci, Giuseppe L. 87
Peters, H. 64,73
Peterson, John B. 62,86,103 106,108,123
Petit, H. 102
Pierce, Samuel S. 125
Pinsent, D. H. 125
Pivetti, Valentino 11,33,38
Planck, C. E. 47
Plendl, H. 43
Polk, George W. 84,101,113
Poor, Charles Lane 8
Potter, Leslie S. 3,26,35,50 59,64,109,123
Powel, J. 23
Purcell, C. W. 40
Pye, W. G. 31
Raethjen 24
Rahskopff, H. 50
Ramsey, Logan Carlisle 4,15 16,26,27,37,40,65,73,82,109 123
Rawlings, Arthur L. 65,115
Redman, L. A. 97
Redpath, Peter H. 25,39
Rege-Gianas, Febo 71
Reid, Elliot G. 66,74
Reymond, L. 11
Rhea, T. R. 110
Riabouchinsky, D. P. 77
Rice, C. W. 80
Rilliet, Charles E. 87
Ritscher, A. 109
Robert, Guy 92
Roberts,Henry W.43,44,78,134 137
Robin 104
Robinson, James 55,56,58,82 143,145
Robson, William A.76,124,130 133
Röder, Hermann 27
Ross, James B. 93
Ross, W. 134
Roth, W. 51
Rouch, J. 67,124
Round, H. J. 58
Rounds, E.W. 67,101,118,129
Rovuchin, A.G. 4
Rowe, A.P. 18,28,68,110
Rozenberg, Y. 4,59
Rust, Armistead 8,19,30,32
Saharov, L. 108
Sanford, R.L. 101,118,129
Sankey, H. Riall 145
Santoro, G. 5
Sasaki, Tatudirô 63,72,84
Scheller, O. 53
Schieferl, F. 75,86
Schmid, Erich 88
Schmidt, Oswald 12,23,44
Schoeffel, M. F. 65,110
Schreiber, Ernest 64,80
Schulz, R. 141
Serre, M. 48,49
Severino, Giuseppe 12,14,16
Shtrihbakh, N.K. 4
Simeon, Giuseppe 13,16,25,83 126
Simmons, L. F. G. 66,74
Sirito, D. 133
Sloley, R. W. 63,109
Sluiters, A. 143
Smith, Clyde W. 62,108,123
Smith, J. E. 127,142
Smith, R. H. 68,75
Smith, S. B. 45,47,133,136
Smith, W. L. 41
Smith-Rose,R.L. 43,51,53,142 143
Sönnichsen, Theodore E. 1,8
Solier, M. Teissié 73
Solt, C. T. 135
Sontag, Harcourt 61
Spaulding, Ellis R. 62,72
Spence, E. H. D. 11
Spencer, G. K. 89
Sperry, Elmer Ambrose 89,95 97,99
Spirin, I. 16,17
Stark, Howard C. 48
Starling, S. G. 119
Steel, W. A. 142
Steffen, Hans 9,41
Sterlugov, B. V. 4,40
Stetson, H. T. 31

Stewart, Charles John 15,64
  73,74,84,100,105,124,127,
  146
Stewart, Oliver 3,35,50,63,64
  107,123
Stillman, M. H. 101,118,129
Stone, J. H. 99
Strickland, Harold H. 23
Strother, D. H. 106
Suckstorff, G. A. 102
Süring, R. 9
Summers, John Kenneth 2
Sunnocks, R. 87
Suplee, Henry Harrison 104
Swisher, L. N. 131
Swoffer, Frank Arthur 3,35,50
  63,107,123
Sylvander, R.C. 67,101,118,129
Sylvestre, Jean 123
Symarokova 15
Tangye, N. 89
Taranger, A. 43
Tate, George 72,121,146
Tate, Rinzi 84
Tea, Peter L. 94
Tear, J. D. 109
Teitz, M. A. 73
Tenani, M. 21,117,124,125
Thaden, Herbert V. 29,56
Thauss, A. 92
Thierry, N. 19
Thoma, D. 110
Thomas, T. R. 99
Thompson, F. L. 61,71
Thompson, R. E. 144
Thurlow, Thomas L. 12
Thurston, Albert P. 77
Tilney, W. A. 9
Tinaglia, Guglielmo 3
Titterington, M. M. 112,113
Tivy, R. V. 130
Tobita, N. 78
Topp, R. 125
Tosi, A. 25
Trent, W. C. 61,90,114
Tscherning, H. 79
Turner, Charles L. 112
Turner, H. G. 130
Tymms, F. 18,28,37,55
Uttmark, F. E. 17
Van der Hoop, J. 18,28,55,110
Van Sickle, L. J. 131
Van Steenbergen, B. 78
Vargas, Rafael 115
Vicedomini, F. 140
Vincent, H. 119
Vitkevich, V. I. 6,28
Vivié, Jean 54
Voelker, W. 105
Voigt, Oskar 9,20
Volta, H. 98
Wackett, L. J. 25
Walter, Louis H. 6,57
Warner, Edward Pearson 5,55
Warner, John A.C. 85,86,101
  103,106,118,129
Watt, R. A. W. 136,143
Wead, Frank Wilbur 1,23,26,34
  46,62,63,109,120
Webb, L. D. 39,72,146
Wedemeyer, A. 6,18,41,52,55,56
Weems, Mrs. M. T. 20
Weems, Philip, V.H. 1,5,11,12
  13,14,15,16,17,20,23,24,27
  30,31,33,34,36,37,38,40,44
  59,90,107,108,112,114,116
  120,121,126,127
Weems, W. R. 43,71
Weiss, E. 122
Wenk, F. 105
Whitaker, O. B. 89
White, J. D. 9,19
Whitel, H. 88
Wiegand, F. 131
Wildhack, W.A. 61
Wiley, H. V. 17,37,53
Williams, Frank 39
Williams, J. E. 144
Wills, F. P. 117
Wimperis, H.E. 7,22,32,60,67
  68,74,85,99,101,107,110,128
  147
Wines, James P. 146
Winter, H. T. 2,13,24,39,47
Winters, S. R. 54,103,106
  142
Wirtz, C. 11
Wittner, Howard A. 90
Wollé, Georg 132
Wood, R. S. 56
Yancey, Lewis Alonzo 4,27,35
  36,40,65,110
Yosida, Tokurô 63,72
Zahm, A. F. 68,75,104,129
Zand, S. J. 131
Zeigler, S. J. 76
Zonta, M. 55